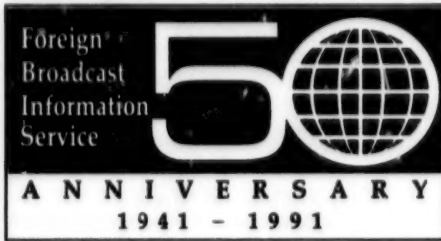


JPRS-TND-91-014  
12 SEPTEMBER 1991



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# ***JPRS Report***

# **Proliferation Issues**

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# PROLIFERATION ISSUES

JPRS-TND-91-014

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12 September 1991

[This report contains foreign media information on issues related to worldwide proliferation and transfer activities in nuclear, chemical, and biological weapons, including delivery systems and the transfer of weapons-relevant technologies.]

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**SOUTH AFRICA**

**Defense Minister Bans Nuclear Weapons Production**

*MB3008162491 Johannesburg South African  
Broadcasting Corporation Network in English  
1545 GMT 30 Aug 91*

[Text] The manufacture of nuclear weapons has been banned by the outgoing minister of defense, General

Magnus Malan. In a notice published in the latest Government Gazette, General Malan says the ban applies to the development, manufacture, marketing, import and export of nuclear weapons or explosives as set out in the Nuclear Non-Proliferation Treaty. According to the notice any attempt to manufacture these products will be illegal.

## CZECHOSLOVAKIA

### Importance of Soviet Nuclear Fuel Supplies Viewed

AU2808202191 Prague MLADA FRONTA DNES  
in Czech 27 Aug 91 p 3

[Josef Tucek article: "Nuclear Insecurity"]

[Text] Czechoslovakia is supposed to buy 100 million dollars worth of fuel rods for its nuclear power plants from the Soviet Union. The operation of the plants cannot continue without these rods.

At present, in Czechoslovakia, there are four nuclear reactors operating in Jaslovske Bohunice and another four in Dukovany. They are all Soviet VVER 440 pressurized-water reactors. Each of them contains 42 tonnes of nuclear fuel. Each reactor is taken out of operation once a year, and one-third of the fuel is replaced, i.e. the nuclear power plants in Czechoslovakia need a total of 112 tonnes of fresh nuclear fuel annually. This fuel has to come from the Soviet Union because it is the only place where fuel rods suitable for VVER 440

reactors are made. (There has never been a direct correlation between the shipments of Czechoslovak uranium to the USSR and Czechoslovak purchases of the uranium fuel rods.)

For strategic and security reasons, all data regarding shipments of nuclear fuel from the Soviet Union to Czechoslovakia is classified. As we have learned, these shipments have not been discontinued, even in the past few days, and they are in progress now.

Thus, at this time, we can say that even if the supply of nuclear fuel were stopped, the current stock would cover another year of operation of the Czechoslovak nuclear power plants. Recently, Czechoslovakia has indicated interest in obtaining processed nuclear fuel from other countries also. According to expert opinion, however, production of this type of rod would take approximately three years. Hence, the cessation of the nuclear fuel shipments would eventually result in a reduction of the Jaslovske Bohunice and Dukovany production and a certain increase in the operation of thermal power plants. Because of the gradual decline of production in Czechoslovak industry, however, demand for electricity is declining, and the power plants are preparing reduction programs. Under these conditions, the Czechoslovak energy system should be able to cover the eventual interruption in supply.

## ARGENTINA

### Atomic Energy President Favors Nuclear Program

*PY2208182691 Buenos Aires Radio Nacional Network  
in Spanish 1600 GMT 22 Aug 91*

[Text] Manuel Mondino, president of the National Commission for Atomic Energy [CNEA], has said that Argentina is one of only 10 countries that managed to control the uranium enrichment process to use nuclear energy. The country is therefore in the First World, Mondino said.

Mondino said he favors the nuclear power plants program because without energy the country's growth will not be possible.

### Space Commission To Build Rocket for Satellites

*PY2408152291 Buenos Aires NOTICIAS  
ARGENTINAS in Spanish 2105 GMT 23 Aug 91*

[Text] Buenos Aires, 23 Aug (NA)—Jorge Saade, the new chief of the National Space Activities Commission, revealed today that Argentina, together with Brazil and Mexico, will begin technical studies to develop a light satellite-launching rocket.

The commission replaces a similar organization that was under the control of the Air Force and was deactivated when the government decided to discontinue the controversial Condor-II missile project.

The new commission is under the direct supervision of the presidency.

In an exclusive interview with NOTICIAS ARGENTINAS, Saade expressed his hope that the commission "will turn into Argentina's NASA," in allusion to the U.S. agency that dedicates itself to space research.

"It is indispensable that we continue with the development of the necessary technology that was started 30 years ago in order to carry out space research and operations," he said.

He added: "We are evaluating the possibility of developing a launching vector for light satellites, in other words, approximately 200 kg, which can be undertaken jointly with Mexico and Brazil."

When talking about cooperation, the commission's new chief implied that it is an absolutely peaceful project. It is unthinkable to believe in the development of war materiel in cooperation with two Latin American countries, although he did not say so in a clear-cut way.

Regarding Condor-II, Saade said: "For the time being, the only thing I can say is that no one has talked about destroying anything. On the contrary, rather we are thinking about how we can construct space technology."

"For now," he mused, "a country that wants to compete in the space market must count on a launch rocket, otherwise it will always depend on third countries or space agencies."

He explained that the fact the commission "is in the hands of civilians is a very good thing and is in consonance with the current political reality of other nations. Argentina is a pioneer in this activity because it began space research in 1960."

"However," he complained, "very little has been done between then and now."

Regarding the commission's future, the astronomer said the construction of a satellite called SAC-B is "a very concrete project."

The Science and Technical Secretariat, CONICET [National Council for Scientific and Technological Research], and the Argentine Institute of Astronomy and Space Physics, which will be in charge of the experiment, are involved in this project.

"The construction of the SAC-B and its launching by NASA in 1994 will mean the countdown for Argentine space research. It will be the initial kickoff for the country's important economic and scientific developments."

Engineer Hugo Casadella will occupy the commission's vice presidency, and the team is made up of [name indistinct] Roca, William Chapman, Horacio Ghielmetti, Humberto Cincaglini, Andres Cisneros, and retired Brigadiers Carlos Bosch and Humberto Ricciardi.

## BRAZIL

### CNEN Head Views Nuclear Projects, Budget, Argentina

*91WP0127A Buenos Aires ARGENTINA NUCLEAR  
in English Apr-May 91 pp 22-26*

[Interview with Dr. Jose Luis de Santana Carvalho, president of CNEN [Brazilian National Nuclear Energy Commission] by ARGENTINA NUCLEAR staff; place and date not given]

[Text] During the first days in April, during a meeting of the Permanent Argentine-Brazilian Committee on nuclear policy subjects, ARGENTINA NUCLEAR had an interview with Doctor Jose Luis de Santana Carvalho, president of the Brazilian National Nuclear Energy Commission (CNEN). The occasion was appropriate for analyzing the projects and policies in the Brazilian nuclear sector, their relation with President Collor's government and the enthusiasm produced by the renewed links with our country.

[ARGENTINA NUCLEAR] It seems that, lately, there has been a special dynamism in Brazilian nuclear activities. Do you share this idea? What is the reason for it?

[Santana Carvalho] President Collor started his mandate with a quite strong conviction regarding morals and ethics. We believe in the same attitude and behave accordingly. Three weeks after the new government took office, when I was already the president of the Brazilian Nuclear Energy Commission, we started applying international safeguards.

We spent one and a half months reviewing technical subjects. In May, we started the instrumentation of safeguards. The first facility to be inspected was a military one. For such purpose, before starting, I had many conversations with all civil and military men interested in the subject. The dialogue included high-ranking militaries, civilians and scientists involved in the subjects we are dealing with. This is why, in May, things were already firm and peaceful.

[ARGENTINA NUCLEAR] Then, was there consensus?

[Santana Carvalho] Yes. Consensus was reached on the fact that national safeguards were necessary.

[ARGENTINA NUCLEAR] Was there any resistance from a given military sector?

[Santana Carvalho] No. The greatest resistance came from our Commission itself. Objections arose among our scientists, from our laboratories. Until the need for national safeguards was made clear. The subject was solved a few days before both presidents met.

[ARGENTINA NUCLEAR] How could you describe the Brazilian public opinion concerning the nuclear programme?

[Santana Carvalho] As good. I feel things are more restful now. Since the present government took office. Discussions are presently being held, considering that the nuclear matter belongs to everyone. This started only a few days after President Collor's government took seat. He created an open working team that started discussing the whole Brazilian nuclear problem, including things that are the most difficult to explain. Everything started to be analyzed very openly with scientific societies, with class associations, with entrepreneurs, with everybody, in a broad sense.

We have also gone through a process of aperture toward the press. Because, although we have nothing to hide, the press has the right to come to us and ask. This has given way to a quite open and favourable atmosphere. This is why now, when I have a newspaper in my hands, I feel restful and thankful.

[ARGENTINA NUCLEAR] Which are—in your opinion—the priorities to be solved within the Brazilian nuclear activity? Is there a nuclear programme?

[Santana Carvalho] The Brazilian nuclear programme has not been announced officially as yet; however, there are certain things we may say that are fundamental in the development desired by the government.

For instance: we are interested in a 100-Megawatt reactor of the PWR [expansion unknown] type. This reactor may be used, at a higher output, for naval propulsion. And, also, at 100 megawatts, for electric power. We have been developing this for quite some time, through the use of the most modern tools, and it will be completely safe. It will be fully designed in Brazil, with all of its equipment and materials made locally.

[ARGENTINA NUCLEAR] What will be its name?

[Santana Carvalho] I still don't know. We estimate it will be ready for the year 2000. We are also prepared to start building a mini-prototype of 11 megawatts, which will be crucial both for naval propulsion and for generation. There are other subjects, non related with propulsion, which are also important.

All these plans imply an investment of 12,000 billion dollars, for emergency self-technology plans, which we are going to start during the second half of this year. We are looking forward to prompt responses to nuclear emergencies in the plants and facilities located all over the country.

Another important issue in our minds is that related to nuclear wastes. We had an important local accident and, therefore, this is one of the main priorities.

Then, our plans include the 11 MW reactor and other reactors, plus one for the production of radioisotopes.

We keep thinking of transferring the whole thing to private hands. In the case of the 100 MW reactor, we are negotiating the financing of the prototype facility, which will cost 400 million dollars, with a State-owned enterprise.

[ARGENTINA NUCLEAR] How are your nuclear power plants operating?

[Santana Carvalho] Angra I has been operating without interruptions for 184 days, while there is perfect understanding between the operator—which is not the Commission but a public agency in the electrical field—and the Commission as the Authority.

[ARGENTINA NUCLEAR] What about Angra II?

[Santana Carvalho] The solution for Angra II will be fully entrepreneurial. We do not want the government to get involved in this matter, since difficulties do always arise. The decision has already been taken, but it is an entrepreneurial subject. I am not the person responsible for this matter. The government has appointed those who take care of the negotiations with the constructor, KWU and Siemens.

[ARGENTINA NUCLEAR] That is, Angra II will be left in private hands?

[Santana Carvalho] Our purpose is the privatization of Angra II and Angra III, since their contracts are interconnected. We want to build both plants.

[ARGENTINA NUCLEAR] Would the private firms take care of both construction and operation, or would they only build?

[Santana Carvalho] They would take both, since a financial agreement must be reached. We know we want to privatize. We need 800 million dollars, because the other half is already available. We want this investment to be made by those interested. Large local construction firms are also interested; two of the largest ones are already related to Angra II and Angra III. Decisive conversations will start being held within two or three months.

[ARGENTINA NUCLEAR] Your statements indicate that the Commission will take care of neither the construction nor the operation.

[Santana Carvalho] That's right.

[ARGENTINA NUCLEAR] And, what is the work of the Commission aimed at? Research, development...?

[Santana Carvalho] There may be some productive activities, but we are handing all this over to private hands and turning into research and development, to nuclear research, considering that our institutional model is more adequate for these purposes. I am a scientist and a college professor but, at the same time, I have had a long experience in private enterprises and, consequently, I feel that, for our model, productive and technical tasks must be performed by a technology enterprise. Our Commission is the one that can do this better and more efficiently. We have not been prepared for an enterprise. We have a scientific mentality and it is more sensible to look forward to our roots.

[ARGENTINA NUCLEAR] Is the Commission's budget approved by the government?

[Santana Carvalho] Presently, in Brazil, the general budget is quite limited, although I consider some areas may be better off, I think that the nuclear sector is far-reaching in the national scale and is devoted to safety in reactors, to the production of radioisotopes and to other valuable issues.

[ARGENTINA NUCLEAR] Does the Brazilian Government believe that—by means of research and technological development work—the Commission will generate an income for the Commission itself and for the State?

[Santana Carvalho] The people who are dealing with the budgetary problems and participating in the most important political decisions must be brought closer to our subject and must be shown what we do. This is a slow task. Last week, after a conversation I held with the

director of the federal budget, he could rapidly understand what I wanted just because some months ago he visited our facilities and could feel our problems more closely. This is so much so, that President Collor is also going to visit us within the next few months, thus demonstrating that the government is more accessible and interested. However, personally, I do not think nuclear energy must be one of the priorities in our government. Now, priorities are: inflation, hunger and health.

[ARGENTINA NUCLEAR] How do you feel about the progress in the Argentine-Brazilian relations, the joint negotiations, the Tiatelolco subject, the possibilities of sharing research and development?

[Santana Carvalho] I am satisfied with the discussions being held with the Argentine Government. Besides, the members of the Permanent Argentine-Brazilian Committee are my personal friends. This shows which is the atmosphere in which the discussions are held. I remember that, in October last year, in the occasion of our institutions' anniversary—which is far-reaching to us—we granted a prize to CNEA. Dr. Mondino travelled to Brazil to receive it. It was important for us. It was like a revolution in the relations between both countries. And, at that time, Mondino was so moved that he moved the public. I think that the whole integration with the South was started with the Foz de Iguazu document and with the meeting of both presidents, which was later followed by a meeting of the four presidents in the region.

[ARGENTINA NUCLEAR] The agreements between Brazil and Argentina eased international public opinion concerning their intentions and their acceptance of control by the International Agency. Does that also help locally?

[Santana Carvalho] Yes, it does. The relationship between the Commission and the scientific community is difficult. I was a member of the scientific community, but was involved in the Commission. However, in Collor's government, all the energy officials in the Commission came from the scientific community. All the past critics are now integrated and take part of high-ranking levels. This has created a favourable atmosphere between scientists and the Commission. In September last, for the first time in 12 years, CNEN's president attended a meeting of nuclear physicists in which nuclear projects were being discussed. He invited them to Parana, where we have an enrichment plant. What was banned before, now can be made. Nuclear physicists will select a group, among themselves, for visiting an enrichment operation for the first time, as well as what is being done in technological development, which is also theirs. Since this is not exclusive of the Commission or of the Armed Forces.

As far as I am concerned, I will always be willing to accept positive contributions coming from any sector of

the community. I would like the nuclear programme to be viewed as a national effort, as a joint effort of the Brazilian society.

### **Text of Joint Argentina Nuclear Accord**

*91WP0125A Sao Paulo GAZETA MERCANTIL  
in Portuguese 30 Jul 91 p 14*

[Text] Presidents Fernando Collor de Mello of Brazil and Carlos Saul Menem, of Argentina will sign a safeguards agreement with the International Atomic Energy (IAEA) in Vienna on 18 September 1991, in the context of the accord for exclusively peaceful use of nuclear energy that the two countries signed in Guadalajara, Mexico in mid-June.

To be able to sign this agreement with the IAEA, Brazil and Argentina need to set up the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC). This will be done as soon as the agreement has been approved by the legislatures of the two countries.

Planalto Palace is preparing a statement of justification to accompany the text of the accord signed by the two countries, and it will be sent to the National Congress as soon as possible. The same procedure is expected to be followed on the Argentine side. Secretary of Science and Technology Jose Goldemberg does not foresee any problems in getting the accord on peaceful use of nuclear materials approved. But administration sources do anticipate some difficulties in winning approval at the end of this year of the safeguards agreement with the IAEA, since the Chamber of Deputies' Congressional Investigation Committee (CPI) has concluded that inspection of Brazilian nuclear activities by international bodies will not be welcome.

Following is the full text of the accord for the peaceful use of nuclear energy that was approved by Brazil and Argentina.

### **Accord Between the Federative Republic of Brazil and the Argentine Republic for the Exclusively Pacific Use of Nuclear Energy**

The Government of the Federative Republic of Brazil and the Government of the Argentine Republic, hereinafter called "the Parties";

Noting the progress made in bilateral nuclear cooperation as a result of the mutual efforts in the context of the Cooperation Agreement for Pacific Use of Nuclear Energy, signed at Buenos Aires on 17 May 1980;

Recalling the commitments assumed in the joint declarations on nuclear policy of Foz do Iguazu (1985), Brasilia (1986), Viedma (1987), and Ipero (1988), reaffirmed by the Joint Communique of Buenos Aires of 6 July 1990;

Considering the decisions adopted in the Declaration on Common Nuclear Policy of Foz do Iguazu on 28 November 1990;

Reaffirming their decision to deepen their commitment to the process of integration between the two countries;

In light of the Treaty on Integration, Cooperation, and Development signed by the Federative Republic of Brazil and the Argentine Republic on 29 November 1988, and Nuclear Cooperation Protocol No. 17 of 10 December 1986;

Recognizing the importance of the use of nuclear energy for pacific purposes for the scientific, technological, economic, and social development of their peoples;

Agreeing that the benefits of all applications of nuclear energy must be accessible for pacific purposes to all States;

Reaffirming the principles of the Treaty for the Prohibition of Nuclear Weapons in Latin America;

Agree to the following:

### **Basic Commitment**

#### **Article I**

1. The Parties agree to use for exclusively pacific purposes the nuclear materials and facilities subjected to their jurisdiction or control.

2. The Parties therefore agree to prohibit and to prevent in their respective territories, as well as to abstain from carrying out, promoting, or authorizing, directly or indirectly, or from participating in any manner in the following: (a) The testing, use, manufacture, production or acquisition, by any means, of any nuclear weapon; and (b) The receipt, storage, installation, placement or any form of possession of any nuclear weapon.

3. In view of the fact that at present no technical distinction is possible between explosive nuclear devices intended for pacific purposes and those destined for war use, the Parties further agree to prohibit and to prevent in their respective territories, as well as to abstain from carrying out, promoting, or authorizing, directly or indirectly, or from participating in any manner in the testing, use, manufacture, production or acquisition, by any means, of any explosive nuclear device as long as the aforesaid technical limitation persists.

#### **Article II**

Nothing in the provisions of this Accord shall affect the inalienable right of the Parties to carry out research, production, and use of nuclear energy for pacific purposes, and each Party preserves its industrial, technological, and commercial secrets, without discrimination, in accordance with Articles I, III, and IV hereof.

### Article III

Nothing in the provisions of this Accord shall restrict the right of the Parties to use nuclear energy for the propulsion or operation of any type of vehicle, including submarines, provided that both are peaceful applications of the nuclear energy.

### Article IV

The Parties agree to submit all the nuclear materials [present] in all the nuclear activities that are undertaken in their territories, or that are subjected to their jurisdiction or are under their control at any location, to the Joint System for Accounting and Control of Nuclear Materials (SCCC), established under Article V hereof.

### Article V—The Joint System for Accounting and Control of Nuclear Materials

The Parties hereby establish the Joint System for Accounting and Control of Nuclear Materials, (hereinafter called the "SCCC"), the purpose of which shall be to verify, in accordance with the basic directives set forth in the annex that is an integral part hereof, that the nuclear materials [present] in all nuclear activities [undertaken] by the Parties are not diverted to nuclear weapons or other explosive nuclear devices pursuant to Article I.

### Article VI—The Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials

The Parties hereby establish the Brazilian-Argentine Agency for Accounting and Control over Nuclear Materials (hereinafter called the "ABACC"), which shall have independent legal identity in order to fulfill the objective attributed to it by this Accord.

### Article VII—Objective of the ABACC

The objective of the ABACC is to administer and apply the SCCC pursuant to the provisions of this Accord.

### Article VIII—Prerogatives of the ABACC

The ABACC shall have the following prerogatives: (a) Reach agreement with the Parties on new General Procedures and Manuals of Application, and on any modifications that may be necessary to those that already exist; (b) Conduct the inspections and other procedures stipulated for the application of the SCCC; (c) Designate the inspectors who will perform the inspections referred to in subpart (b); (d) Evaluate the inspections made during the application of the SCCC; (e) Contract for the services necessary to ensure fulfillment of its objective; (f) Represent the Parties before third parties in matters concerning the application of the SCCC; (g) Conclude international agreements, with the express authorization of the Parties; and (h) Serve as representative in the courts.

### Article IX—Organs of the ABACC

The ABACC shall be composed of a Commission and a Secretariat.

### Article X—Composition of the Commission

The Commission shall be composed of four members, with each Party being entitled to designate two of them. The Commission shall be constituted within not more than 60 days of the date this Accord enters into force.

### Article XI—Duties of the Commission

The duties of the Commission shall be to: (a) See that the SCCC functions; (b) Approve the General Procedures and Manuals of Application referred to in Article VIII(a), as negotiated by the Secretariat; (c) Find the means necessary to establish the Secretariat; (d) Supervise the functioning of the Secretariat, drafting such instructions and directives as it deems appropriate in each case; (e) Designate the professional personnel of the Secretariat and approve the designation of auxiliary personnel; (f) Prepare the list of duly qualified inspectors, from among those proposed by the Parties, who are to carry out the inspection tasks ordered by the Secretariat; (g) Report any abnormalities that may arise in the application of the SCCC to the corresponding Party, which shall be obliged to take the necessary measures to correct the situation; (h) Request the Parties to set up such ad hoc advisory groups as deemed necessary for the satisfactory functioning of the SCCC; (i) Report annually to the Parties concerning the progress of the application of the SCCC; (j) Report to the Parties the noncompliance, by one of the Parties, with the commitments assumed under this Accord; and (k) Enact its own regulations and those of the Secretariat.

### Article XII—Composition of the Secretariat

1. The Secretariat shall be composed of professional personnel designated by the Commission, and auxiliary personnel. During the performance of their duties, the staff of the Secretariat shall be subject to the regulations approved and directives issued by the Commission.
2. The highest-ranking officials of the nationality of each Party shall alternate annually in serving as Secretary of the ABACC, beginning with the individual whose nationality is different from that of the host country.
3. The inspectors designated under Article VIII(c) shall, while exercising the functions assigned by the Secretariat as regards the SCCC, be subordinate exclusively to that Secretariat.

### Article XIII—Duties of the Secretariat

The duties of the Secretariat shall be to: (a) Implement the directives and instructions established by the Commission; (b) In that context, to perform the activities necessary to the application and administration of the SCCC; (c) Act, by Commission mandate, as representative of the ABACC in its relations with the Parties and

toward third parties; (d) Designate, from among the inspectors whose names appear on the list mentioned in Article XI(f), those who are to perform the tasks of inspection determined by the application of the SCCC, taking into account that inspectors who are citizens of one of the parties shall inspect the facilities of the other Party; also, give instructions to same as to the performance their duties; (e) Receive the reports from the inspectors with the results of their inspections; (f) Evaluate the inspections in accordance with the appropriate procedures; (g) Immediately inform the Commission of any discrepancy in the records of either of the Parties found during the evaluations of the results of the inspections; (h) Prepare the budget of the ABACC for approval by the Commission; and (i) Report periodically to the Commission on its activities, particularly on the progress of the application of the SCCC.

#### **Article XIV—Confidentiality of the Information**

1. The ABACC shall not be authorized to divulge industrial or commercial information, or any other information of a confidential nature, concerning the facilities and characteristics of the nuclear programs of the Parties without their express consent.

2. Without prejudice to the responsibilities of the ABACC, the members of the Commission, as well as the staff of the Secretariat, the inspectors, and all persons involved in the application of the SCCC shall not reveal industrial or commercial information, or any other information of a confidential nature, concerning the facilities and characteristics of the nuclear programs of the Parties to which they may have had access as a result of the performance of their duties, or on the occasion of the performance thereof. That obligation shall continue even after they have ceased performing their duties in the ABACC or in relation to the application of the SCCC.

3. The penalties for violations of paragraph 2 of this article shall be determined by the respective national laws, and it shall be up to each Party to penalize the violations committed by its nationals, regardless of where they were committed.

#### **Article XV—Headquarters of the ABACC**

1. The headquarters of the ABACC shall be in the city of Rio de Janeiro.

2. The ABACC shall negotiate the respective Headquarters Agreement with the Federative Republic of Brazil.

#### **Article XVI—Financial and Technical Support**

1. The parties shall equitably furnish the funds necessary to the operation of the SCCC and the ABACC.

2. The Parties shall make their technical capabilities available to the ABACC in support of its activities. Persons who are appointed temporarily to perform those support tasks shall be bound by the obligation established in Article XIV.

#### **Article XVII—Privileges and Immunities**

1. The ABACC shall enjoy independent legal identity and full legal capacity. Its privileges and immunities and those of its staff in Brazil shall be established in the Headquarters Agreement prescribed by Article XV.

2. The privileges and immunities of inspectors and of the other personnel who are on temporary missions in the service of the ABACC shall be established in an Additional Protocol.

#### **Article XVIII**

Interpretation and application differences arising in the interpretation and application of this Accord shall be resolved by the Parties through diplomatic channels.

#### **Article XIX—Noncompliance With the Accord**

Serious noncompliance with the present accord by one of the Parties shall authorize the other Party to consider the Accord as terminated or to suspend its application, fully or partially, and it shall be the duty of that same Party to so notify the Secretary General of the United Nations and the Secretary General of the Organization of American States.

#### **Article XX—Ratification and Entry Into Force**

This Accord shall enter into force on the date of the exchange of the respective instruments of ratification. Its text shall be transmitted by the Parties to the Secretary General of the United Nations and the Secretary General of the Organization of American States, for recording.

#### **Article XXI—Amendments**

This Accord may be amended by the Parties at any time, by mutual agreement. Amendments shall take effect pursuant to the procedure stipulated in Article XX.

#### **Article XXII—Duration**

This Accord shall remain in force indefinitely. It may be terminated by either of the parties by a diplomatic note addressed to the other, with notice thereof to be given by the renouncing Party to the Secretary General of the United Nations and the Secretary General of the Organization of American States. Termination shall take effect six months following the date of receipt of that diplomatic note.

Done at the city of Guadalajara, United Mexican States, on the ... day of the month of July, 1991, in two originals, each of them presented in both the Portuguese and Spanish languages, both texts being equally authentic.

**Annex: Basic Directives of the Joint System for  
Accounting and Control of Nuclear Materials**

**Article I**

1. The Joint System for Accounting and Control of Nuclear Materials (SCCC) is a set of procedures instituted by the Parties for the purpose of verifying, with a reasonable degree of certainty, that the nuclear materials present in all their nuclear activities are not diverted to nuclear weapons or other explosive nuclear devices, according to the terms of this Accord.

2. The SCCC encompasses the General Procedures and the Manuals of Application, by category of facility.

**Article II**

The foundation of the SCCC shall be a structure of nuclear materials accounting areas, and one of the following starting points shall be used for its application: (a) The production of any nuclear material of such composition and purity as to make it suitable for its direct use in the manufacture of nuclear fuel or in isotopic enrichment, including the subsequent generations of nuclear material produced from those materials; (b) The importation of any nuclear material having the same characteristics as stipulated in subpart (a) above, as well as any other nuclear materials that were produced in a subsequent phase of the nuclear fuel cycle.

**Article III**

Nuclear materials shall cease to be subject to the SCCC when: (a) They are transferred to a point outside the jurisdiction or control of the Parties; or (b) They are transferred to nonnuclear use, or to a nonnuclear use not significant from the standpoint of the SCCC; or (c) They have been consumed, diluted, or transformed in such a way that they cannot be used for any nuclear use that is significant from the SCCC standpoint, or are practically irrecoverable.

**Article IV**

The application of the SCCC to nuclear materials used for the nuclear propulsion or operation of any type of vehicle, including submarines, or in other activities that by their nature require special procedures, shall have the following distinct characteristics: (a) Suspension of the inspections, of access to the accounting and operational records, of the notifications, and of the reports stipulated by the SCCC regarding those nuclear materials for such time as they are allocated to the aforementioned activities; (b) Resubmission of such nuclear materials to the procedures described in subpart (a) above, when they are no longer allocated to those activities; (c) Recording by the ABACC of the total volume and the composition of those nuclear materials that are under the jurisdiction or control of one of the Parties, as well as of any transfer of same to a point outside such jurisdiction or control.

**Article V**

The appropriate level of accounting and control of nuclear materials shall be determined for each facility according to the strategic value obtained from the analysis of the following variables: (a) Category of the nuclear material, taking the significance of its isotopic composition into account; (b) Conversion time; (c) Inventory/flow of nuclear material; (d) Category of the facility; (e) Degree of importance of the facility compared with others that exist; and (f) Existence of containment and surveillance methods.

**Article VI**

When pertinent, the SCCC shall include measures such as the following: (a) A system of records and reports that reflects, for each nuclear materials accounting area, the inventory of nuclear materials and the changes in such inventory; (b) Provisions for the accurate application of the accounting and control methods and procedures; (c) Measurement systems to determine the inventories of nuclear material, and changes therein; (d) Evaluation of the precision and degree of approximation of the measurements, as well as the calculation of their imprecisions; (e) Procedures to identify, review, and evaluate differences in supplier-consignee measurements; (f) Procedures for conducting a physical inventory; (g) Procedures for determining and evaluating materials not accounted for; and (h) Application of containment and surveillance systems.

**Reaction to Accords With IAEA, Argentina**

**Inspection Not 'Intrusive'**

91WP0126A Sao Paulo GAZETA MERCANTIL  
in Portuguese 30 Jul 91 pp 1, 15

[Commentary by Sao Paulo correspondent Jose Casado]

[Text] The Armed Forces nuclear program will stop being secret when Brazil—along with Argentina—accedes to the Safeguards Agreement with the International Atomic Energy Association (IAEA), a move expected to take place on 18 September.

That is the version being put out by the federal government which, after a decade and a half of international pressure, has ended up radically changing one of the principal tenets of its foreign policy—this country's steadfast refusal to sign the agreement, a basic component of the Nuclear Nonproliferation Treaty that is still being negotiated.

In theory, Brazil is ready to reveal its best-kept (and most expensive) military atomic secrets. It will submit to a series of IAEA measures that together constitute the "inspection of all nuclear material that enters and exits" its nuclear power plants and research laboratories—as Secretary of Technology and Development Jose Goldemberg explained to editor Maria Helena Tachinardi.

The military atomic project (which the government called "parallel" or "autonomous") got under way during the 1970's following the purchase of German nuclear technology for generating electrical energy.

The official nuclear program, contracted with Germany at a cost of about \$10 billion, according to the government's bookkeeping, has not turned out well, at least not so far. Its symbol is the nuclear plant at Angra dos Reis, which has structural and ecological problems. Because there have been so few days when it is operating, it has become known in the bureaucracy as the "glow-worm."

Meanwhile, the military atomic project has made enough progress to justify concerns in both the United States and Europe about the proliferation of technology and nuclear weapons, with Brazil in the role of one of the potential new and autonomous suppliers.

Clandestine deals with Iraq and China helped to create this international impression. Brazil was responsible for one boost to the Iraqi nuclear program when in 1981, it swapped 70 tons of treated uranium for oil from the Saddam Husayn government. Three years later, it concluded a secret agreement with China and obtained 220 kg of enriched uranium needed to run the Navy laboratories at Ipero (Sao Paulo State).

The Navy controls Brazil's most fully developed military project in the nuclear field. Its complex at Ipero is devoted to technological mastery of the complete cycle for producing fuel and to building a reactor, the primary and secondary circuits that make up the basis of an atomic energy system. It is supposed to enter the trial phase (on an industrial scale) in 1995.

We know that officially, the military has already spent \$405 million on Ipero and managed to enrich uranium to a little more than 20 percent, operating about 500 centrifuges. Plus: they have achieved full autonomy in the techniques for manufacturing the equipment essential to uranium enrichment—the ultracentrifuge.

#### Navy Expenditures on Its Nuclear Program

The fuel cycle	\$180 million (90% in Brazil)
Reactor and its components	225 million (78% in Brazil)
Total*	\$405 million (84% in Brazil)**

\*Officially, this total covers expenses from 1979 to 4 April 1991)

\*\*The rest represents imports

Source: Ministry of the Navy

There is absolute consensus among specialists that the only factor that determines whether a country can enrich uranium for war purposes is the scale of operations. (For example, with 2,000 centrifuges, Brazil would be able to produce as many as three atomic bombs a year, using uranium enriched to more than 90 percent).

There is also a general agreement that with its mastery of the ultracentrifuge manufacturing process, Brazil would

move into a stage where it would be capable of supplying nations that have military programs—the nature of the atomic process makes it applicable to both civilian or military purposes—without significant technical obstacles.

According to information given by Minister of the Navy Cesar Flores to the Chamber of Deputies' Committee on National Defense, the military project at Ipero will "enable the country to build small and medium-scale atomic-fueled electric power plants with its own technology, and Brazil would not be dependent on foreign sources or need foreign guidance." Editor Claudia Izique learned that the official timetable calls for operation at scale [as published] starting in 1995.

The Navy's central objective is construction of a nuclear submarine by the end of the decade. For two years now, the Brazilian Government has been criticized in Germany for allegedly diverting technical personnel, designs, and materials from the official electric power generating project to military research being conducted by the Navy.

From the strategic standpoint, the Navy project, if successful, would greatly alter the balance of naval forces in the South Atlantic. An important step in this direction was taken recently with the purchase, in Germany, of a conventional submarine (the "Tupy") that operates with hybrid technology. It can accommodate a low-power nuclear reactor (producing a maximum of 400 KW) that would give it enough power to move at high speeds and total fuel autonomy, yet increase its weight by only a little more than 100 tons.

However, this is not the only segment of the military atomic program. The Air Force has put its laboratories in Sao Jose dos Campos (Sao Paulo State) to work in another direction: to try to master the technique of laser enrichment of uranium. (This method involves metallic uranium and hexafluoride, using a laser beam of 10,000 hertz—a continuous beam of 100 hertz has already been achieved).

The Army, at its facility in Guaratiba (Rio de Janeiro State), has made the least progress in its plan: to build a reactor that uses pure nuclear graphite. That is the type of reactor that produces the most plutonium, a vital ingredient in any nonpeaceful nuclear device.

With Brazil's accession to the IAEA Safeguards Agreement, the entire military atomic program will supposedly be subject to monitoring.

The semi-annual inspection by IAEA experts will not, however, be "intrusive"—as defined by technology secretary Jose Goldemberg. He says that inspectors will not be able to visit certain parts of the equipment that is subject to the safeguards "so as not to expose industrial secrets."

The agreement reached with Argentina also contains such a provision. Goldemberg gave a practical example:

he told editor Maria Helena Tachinardi that IAEA inspectors "will not have access" to the nuclear submarine being developed at the Navy labs. "The bulk of the work will be done by Brazilian and Argentine inspectors," the secretary explained, indicating that the binational agency will be in charge of accounting for the materials and equipment and reporting the figures to the IAEA.

The government's argument is that the Navy labs do not have the capacity to pursue, nor are they devoted to, the objective of enriching uranium for aggressive military purposes per se. Furthermore, it is argued that in order to operate on a commercial scale Brazil would need 10,000 centrifuges, and only then could it think about becoming a supplier of enriched uranium.

There really is a "war" going on between the countries that have nuclear technology and those who are attempting, independently, to gain that knowledge.

The provisos in the application of the IAEA rules, however, may suggest that the announced government transparency on the subject of the atomic military project may not fully come to pass.

Some internal pressures are being felt in that direction. A segment of the top echelon of the military, the scientific community involved in the projects, and political leaders of nationalist factions are joining together on this point.

Within the National Commission for Nuclear Energy (CNEN) and in the military ministries there are those who say they are apprehensive about the possibility that the Fernando Collor de Mello Administration, or its successors, will open up to IAEA inspection the research laboratories that are under military coordination.

At the CNEN, editor Fatima Belchior heard the following argument: "We are going to hand over something (the ultracentrifuge technology) that was denied us." When Brazil signed a nuclear contract with Germany, it sought access to the ultracentrifuge technology. Urenco (a German-British-Dutch consortium) refused to transfer the technology. This led to the start of the military atomic project, which became relatively successful. Such internal pressures are in part responsible for Itamaraty's reluctance to sign the Nuclear Nonproliferation Treaty.

For now, the government has accepted the IAEA safeguards—but with restrictions typical of those demanded by someone who wants to guarantee continued military atomic secrecy.

#### **Secrets Will Be Preserved**

91WP0126B Sao Paulo GAZETA MERCANTIL  
in Portuguese 31 Jul 91 p 11

[Article by Buenos Aires correspondent Paulo Totti]

[Text] President of the National Commission for Nuclear Energy (CNEN) Jose Luis de Santana Carvalho

denied in Buenos Aires that the safeguards agreement with the International Atomic Energy Agency (IAEA), to be signed on 18 September, represents a retreat from Brazil's decision to preserve technology developed independently by this country and intended for strictly peaceful purposes.

Referring to a report published yesterday in this newspaper in which a CNEN source in Rio expressed a willingness to "hand over something that was denied us (the ultracentrifuge technology)," Santana Carvalho stated: "I am the one who speaks for CNEN and I can assure you that this is not in any way our intention."

According to the CNEN president, what Brazil and Argentina are negotiating with the IAEA is a system of accounting and control "that would detect the diversion of nuclear material to unauthorized purposes." That system, he explained, "provides that what enters has to be compatible with what leaves the nuclear facilities in the two countries."

The inspection, to be handled by Brazilian and Argentine inspectors accredited by the IAEA, "will not be intrusive, i.e., it will not penetrate areas where there are industrial-commercial secrets."

Santana de Carvalho, who has been in Buenos Aires since last Sunday for contacts with his counterparts at the National Commission for Atomic Energy (CNEA) of Argentina, said that what both countries are committing themselves to work with the IAEA in the same as they have already done with England, France, Italy, and Germany. "We will preserve the secrets of all the advances which, using our own resources, we have developed for peaceful purposes. The IAEA itself agrees with this position," said the CNEN president. Santana Carvalho also said that "all Brazilian nuclear installations"—and that includes, obviously, those being used for the Navy's nuclear sub project—"are already being inspected by the CNEN" and will continue to be after the signing of the agreement with the IAEA. He emphasized, however, that his agency inspects only the nuclear facilities, i.e., the submarine reactor, which is then sealed and will remain so until the end of its useful life.

#### **Opposition From Technicians**

91WP0126C Sao Paulo GAZETA MERCANTIL  
in Portuguese 31 Jul 91 p 11

[Article by Fatima Belchior, reporting from Rio de Janeiro]

[Text] The decision by the Brazilian Government to sign an agreement with the International Atomic Energy Agency (IAEA) in September is beginning to spark reactions from technicians in the nuclear energy community. Their main argument against this adherence to IAEA requirements—a step also to be taken by our

neighbor Argentina—is that Brazil may lose its technological privacy, especially regarding the technology being developed by the Navy in order to build a nuclear submarine.

The example frequently cited by the technicians, some of whom are associated with research, is that of the ultracentrifuge developed by the Navy to enrich uranium. Brazil, they argue, achieved its ultracentrifuge independently. Now, faced with the possibility of opening those doors, Brazil also risks allowing access to the materials used in manufacturing the ultracentrifuges and to the system designed for operating them. In practice, that knowledge could reveal the commercial cost of its product, enriched uranium.

So the issue leaves the political realm and enters the commercial field. Business in the fairly competitive nuclear energy field probably amounts to \$50 billion to \$70 billion a year. In the past, the technicians point out, Brazil was denied access to the ultracentrifuge process of uranium enrichment, held by Urenco (Holland, England, and Germany). "That technology is not available for sale. Why are we going to hand it over on a silver platter?" asks one expert, who prefers that we not publish his name.

The fact is that in considering this "new opening," people forget that the agreement with the IAEA will be comprehensive (full scope safeguard) [preceding parenthetical phrase in English]. This means it will not be limited to record-keeping on the volume of fissile material at nuclear units, but can even extend to the levels of technological development.

Brazil and Argentina have already concluded an agreement that does not result in intrusive inspection, one that the technicians say does not pose a threat to Brazil's technological development in the nuclear energy field. What concerns them is the comprehensiveness with which that inspection could occur when Brazil moves into the IAEA universe.

That is why they believe the ideal situation would be to first consolidate the agreement already signed with Argentina, thus gaining experience in implementing the safeguard system adopted with our neighbor. In a second phase, they would move toward other bases for nonintrusive accords.

#### Nothing New in September

91WP0126D Sao Paulo GAZETA MERCANTIL  
in Portuguese 31 Jul 91 p 11

[Text] Brazil will implement the third stage in its anti-nuclear policy in September when it joins the International Atomic Energy Agency (IAEA). With the backing of several countries, including the United States through President George Bush, Brazil is likely to be named to chair the IAEA in the election scheduled for September.

"This year, the chairmanship should be occupied by a Latin American and Brazil has become a candidate for

the post. This story that President Bush is campaigning on Brazil's behalf is just folklore. All the countries are unanimous that this is going to happen," explained Secretary of Strategic Affairs Pedro Paulo Leoni Ramos, who is supposed to represent Brazil at the September meeting.

President Fernando Collor's first step in laying to rest the possibility of manufacturing an atomic bomb in Brazil was to seal the well at Serra do Cachimbo. The second step was the signing of the safeguards agreement with Argentina. That agreement, signed two weeks ago at the Mexico meeting of Ibero-American presidents, will now be ratified at the IAEA meeting.

According to Secretary Leoni Ramos, no new data will be submitted at the September meeting. He told Agencia Brasil that the government believes that Brazil's willingness not to make military weapons has been made quite clear on the international scene.

#### FRG Reaction

91WP0126E Sao Paulo GAZETA MERCANTIL  
in Portuguese 30 Jul 91 p 14

[Article by Maria Helena Tachinardi, reporting from Brasilia]

[Text] Germany is paying attention to the negotiations between Brazil and Argentina and between those two countries and the International Atomic Energy Association (IAEA), headquartered in Vienna, because a decision was made by the German cabinet last August to continue nuclear cooperation with its partners only if they subject their facilities to full IAEA safeguards, this newspaper learned from an official German source.

Brazil has been a customer of the German Government and of KWU ever since the two countries signed an agreement in 1975 for the supply of equipment and transfer of technology. That agreement was renewed in 1989 after intense debate in the German Parliament, during which the Green Party urged terminating the treaty with the Brazilian Government. In 1994 there will be another discussion as to whether or not to renew the accord, which calls for a review every five years.

Brazil intends to complete only two of the eight power plants originally contracted—Angra II and III, and even this can only be accomplished with great difficulty. The German side has already built all the equipment for Angra II and delivered it. The problem is Brazil's lack of funds to do the construction work at both sites, a German source told this newspaper.

#### IAEA Inspection

At any rate, when they do begin to function both Angra II and III will be subjected to IAEA inspection, just as has already occurred with Angra I, whose reactor was purchased from Westinghouse, of the United States.

To the German Government, it is still not clear what kind of safeguards Brazil and Argentina will subject their nuclear facilities to. There are doubts in Germany as to whether the agreement with the IAEA will be comprehensive, or the "full scope safeguard" [preceding three words in English] type, and whether the equipment and facilities really will be inspected. The Germans do not know yet whether anything will be excluded from the inspection—such as the autonomous or parallel programs conducted by the Armed Forces.

The German Government is following the progress of discussions between Brazil, Argentina, and the IAEA through its delegations in Vienna and in Geneva, where the disarmament talks are being held. But it has still not obtained details on the safeguards.

#### **Cooperation Facilitated**

Following the decision made in Bonn last August, cooperation with Germany in the nuclear energy area will be made easier if Brazil signs safeguard agreements with the IAEA or becomes a member of the Nuclear Nonproliferation Treaty. The fear is that without those instruments of control, the country that receives the technology may use it for military purposes. The sensitive technologies in the nuclear and space fields are classified as dual-use, and can be used for both military and civilian ends.

An agreement with the IAEA would have the effect of reassuring Germany that the technology it is transferring is under control, yet without implying disrespect for its partner's sovereignty. The IAEA's "full scope safeguard" [preceding words in English] would alone guarantee the transfer of nuclear technology. It is not a requirement of the German Government that its partners accede to the Nuclear Nonproliferation Treaty, the German source commented.

#### **Secret Accounts for Nuclear Projects Scored**

91WP0133B Sao Paulo FOLHA DE SAO PAULO  
in Portuguese 8 Aug 91 pp 1-2

[Editorial: "Nuclear Silence"]

[Text] Challenging the changes in government that have taken place in recent years, the Brazilian nuclear program is still surrounded by mystery. Now, reports confirmed by the chief of staff of the Department of Intelligence in the Secretariat of Strategic Affairs tell us that secret budgets are still being allocated to nuclear projects.

As in 1986, when four secret accounts were discovered, the sums involved are substantial: at that time, they amounted to \$37 million. Today it is estimated that the funds appropriated since the current president took office amount to about \$65 million.

Inasmuch as this is a country that lives under a democratic regime, such reports can cause only perplexity.

From the mere existence of a "secret program" to the fact that such a large volume of federal funds—already pretty scarce—is being spent without the knowledge of the general public, or even of its representatives in Congress, the whole case seems to have a hopelessly anachronistic stench.

It is also striking that the episode occurs under an administration that just last year, in a spectacular gesture—apparently it was no more than that—closed the proving grounds at Serra do Cachimbo to stop speculation about the nuclear program.

Silence as to the use of funds does not protect our technology—that can be done simply by keeping the results of the research secret and omitting information on the priorities of our governing officials. It is worth noting, furthermore, that the nation's nuclear program has not, so far, distinguished itself by its results. Despite all the enormous outlays—secret and otherwise—it has little to show other than a power plant that has become famous for the intermittence of its operations.

Now it will not be enough for Congress to proceed with its initiatives—laudable, certainly—of monitoring nuclear spending. It is essential that the government stop, once and for all, relying on secret accounts—a practice that ought no longer have a place in a democratic regime like that of Brazil.

#### **Secret Funding of Centrifuge Purchase Assessed**

91WP0134Z Sao Paulo VEJA in Portuguese 14 Aug 91  
pp 24, 25

[Text] Two secrets about the Brazilian nuclear program were revealed last week. The first is how much has been spent in this area during President Fernando Collor's administration. The second is the specific destination of the money. On Sunday 4 August, a report in JORNAL DO BRASIL showed that the Secretariat of Strategic Affairs (SAE)—the former SNI [National Service for Intelligence]—spent 99 percent of a secret \$65 million budget on nuclear activities. The funds were used to import equipment, known as centrifuges, for the Aramar plant at Ipero in the interior of Sao Paulo State, the site of Brazil's largest nuclear research laboratory. When they begin to function about a month and a half from now, the new equipment will be capable of making enough uranium for the first Brazilian atomic bomb.

"Theoretically, that equipment can produce the enriched uranium needed to make a bomb," Jose Luiz de Santana Carvalho, president of the National Commission for Nuclear Energy (CNEN), told VEJA's Luis Costa Pinto, and then added: "But it is obvious that a bomb is not part of the government's plans." It has been known since 1987 that Brazil has mastered the uranium enrichment technology. At that time, the country had an industrial problem—not enough installed capacity to enrich uranium in sufficient volume to build a bomb. With the new centrifuges, at least part of the problem has been solved. "Within a month and a half, the Aramar center will

inaugurate its new equipment and, three months later, it will be possible to build a bomb," says Rio physicist Luiz Pinguelli Rosa.

### 'A Bomb Every Three Years'

Scientists everywhere have mastered the recipe to produce enough uranium of sufficient radioactive power to be used as the explosive nucleus of an atomic bomb. In theory, it can be found in any college physics textbook. In practice, it requires complex industrial facilities. The fastest route is by enriching uranium, a mineral that is plentiful in the interior regions of Minas Gerais State, for example. Once it has been removed from the subsoil, uranium undergoes processing to convert it into a yellowish paste known as "yellow cake," [previous two words in English] absolutely harmless. The next stage is the enrichment—which consists of selecting and concentrating only the most reactive atoms contained in the yellow cake.

If the level of purification is low—about 5 percent, for example—the enriched uranium will be fit only for use as fuel for nuclear power plants. Once purification passes the 90 percent level, however, the material can be used as raw material for an atomic device for warfare purposes. The most common method of enrichment is to process the uranium in centrifuges that are hooked up in series. The level of purity will depend, basically, on the number of centrifuges used in the process. Ipero had 50 when it started working, which enabled it to enrich uranium to a maximum of 5 percent. Today it has more than 900. "That equipment is capable of making enriched uranium in sufficient quantities to build a bomb every three years," said Gerard White, of the Wisconsin Arms Project, an American organization dedicated to controlling the proliferation of nuclear weapons around the world.

Having enriched uranium puts a country only halfway down the road to production of an atomic bomb. It is even suspected that Iraq's Saddam Husayn has his stockpiles of 90 percent enriched uranium hidden in the northern mountains. Manufacturing and exploding an atomic bomb over a specific target is the other—more difficult—half of the job. It is precisely because the technology used in making the bomb's firing mechanisms is highly complex—and access to it virtually closed to nonmembers of the exclusive atomic club—that the Americans are not tearing their hair out because of the news that uranium is being enriched elsewhere in the world. When you have a bomb, but not the mechanism for detonating it over a target—the worst that can happen is an accidental explosion in the lap of some sergeant sitting in a Puma.

In economic terms, the commercial use of uranium that Jose Luiz de Santana Carvalho is pursuing can be a profitable business, provided that production costs are not higher than the market value—now about \$2,000 per kg of 20 percent enriched ore. The problem is, there would be no easier way for the government to dispel all

doubts about its purely commercial intentions than to sign the Treaty of Tlatelolco, thus opening its nuclear facilities to international supervision. The signatories of that treaty have direct access to key technological developments in the field—and even the recently purchased centrifuges could have been acquired more easily. Especially, the move would open the way to the acquisition of high-tech goods such as supercomputers. For at least three years the Brazilian government has been trying to buy a Cray XMP supercomputer, the most powerful in the world, from the United States. Three years ago the U.S. Government vetoed the sale, concerned that the machine might be used for military purposes.

"The developed countries did not master nuclear technology until they began treating it as a strategic and confidential subject," argues Pedro Paulo Leoni Ramos, head of the SAE. This is true. The difference is that in the United States, for example, military research projects are controlled by Congress, which has designated certain legislators to monitor what goes on in the laboratories. In Brazil, the nuclear program is not secret—it is clandestine. Except for Leoni Ramos and a minuscule corps of bureaucrats and military officers, no one knows for sure what is being done, or for what purpose, or why, or at what price. The budgets used by the SAE were submitted to the Congress and approved—but no legislator was told that behind rubric No. 01.010.0099.1061.0001 were funds for the purchase of equipment that could enable this country to produce uranium for atomic bombs. The SAE accounts were also approved by the federal Court of Auditors, but no minister can say exactly how each of the 65 million dollars made available was spent.

### Testing by Computer

"Either the connection between the nuclear program and the SAE has no *raison d'être*, or it has a single *raison d'être*: military use," says Rio physicist Ennio Candotti, president of the Brazilian Society for the Advancement of Science. "Not even I know why the nuclear program is subordinate to the SAE instead of my secretariat," says Secretary Jose Goldemberg who, since he takes care of the science and technology area, would be the ideal official to handle the subject within the Collor administration. Goldemberg is a nuclear physicist by training. Before joining the Collor government, Leoni Ramos had a lobbying firm in Brasilia, and he understands about as much about atoms as businessman PC Farias understands about quantum physics.

It is the clandestinity of the Brazilian nuclear program that makes its objective an eternal mystery. Last year, while President Collor was tossing a shovel of lime into the well dug for nuclear tests at Serra do Cachimbo, in Para State, the SAE was running around buying centrifuges for the plant at Ipero. "A nuclear bomb based on uranium does not have to be test-exploded in a well," insists physicist Pinguelli. "You can make a trial explosion on a computer."

According to specialists, anyone who thinks the Brazilian nuclear program run by the SAE consumes only \$65 million is naive enough to suppose that you can make a rocket with the same technology used in making firecrackers for Midsummer Day festivities. Experts estimate that a program of that nature swallows up no less than \$1 billion a year. Now that the new centrifuges are ready to go, the government needs to take two precautions. The first has already been taken: the equipment is under the surveillance of video cameras and electronic sensors connected directly to the private office of Leoni Ramos, who can monitor from Brasilia everything that happens in the nuclear research laboratories. The results of the second precaution will not become known until a month and a half from now: that is when we will find out whether, when it comes time to enrich the uranium, the machines will actually work or whether they are just imported junk. For those rooting against production of the first atomic bomb, there is always that one last hope.

#### **Import of Nuclear-Related Equipment Difficult**

91WP0133A Sao Paulo GAZETA MERCANTIL  
in Portuguese 15 Aug 91 p 16

[Article by Sao Paulo correspondent Luis Leonel]

[Text] Brazil is having increasing difficulties in importing equipment for the nuclear sector. The main obstacles are encountered in importing precision products such as computerized machine tools and electronic components in general. "If ten years ago we had not begun a project to produce domestically the equipment used in the nuclear sector, the Brazilian nuclear problem would find itself hamstrung today," said Admiral Othon Luiz Pinheiro da Silva, president of the Special Products Coordinating Board (Copesp).

Copesp was responsible for setting up and developing the Aramar nuclear center at Ipero (Sao Paulo State) where the Navy's parallel program was started in 1979. With 530 ultracentrifuges now operating—and the prospect of reaching the 600 level by the end of the year—Aramar has achieved the ability to make 20 percent enriched uranium and is continuing with its development of the nuclear reactor which, initially, will be used to equip Brazil's first nuclear submarine.

At the end of last year, Copesp began negotiating with a German firm to import a reamer, a tool normally used to make cuts in internal surfaces of metals. Owing to the degree of hardness of the metal plates used in a nuclear reactor, Copesp needed to import a reamer that had not only near-absolute precision, but other special features as well. The company would use it to drill the holes in various superimposed metal plates through which the heat exchanger pipes of the nuclear reactor being developed would pass. The proposed import, however, met with resistance from the German government. "It took us more than six months to get the shipment released," Pinheiro da Silva said.

This tool, which cost \$1 million, arrived in Brazil recently and is being installed at Aramar. Equipment that is apparently simple, such as stop valves and other items, are also getting hard to import. "We visit the manufacturers overseas, but when they find out the goods are for Brazil, they are not even interested because they know about the problems in getting the deal approved," said a knowledgeable source in the sector.

The Institute for Nuclear and Energy Research (IPEN), which is associated with the National Commission for Nuclear Energy (C'NEN), experienced a similar problem a month ago. IPEN had learned about a course that was being given in the United States, at the Department of State, on the strength of shielding materials used in the nuclear area. Participation, which would include the receipt of a software program at the end of the course, would cost \$17,000.

According to Adelia Sahyun, head of IPEN's radiation control department, the institute became interested in the course and since it did not have a budget for that purpose, convinced a private company to defray the cost. When IPEN applied to the Department of State to enroll in the course, it found out that Brazil would be allowed to participate but would not be allowed to take home the software, like the other participants. "We canceled the application for enrollment," Sahyun said.

Most of the reluctance on the part of developed countries, especially the United States, to pass on precision equipment to Brazil is due to the fact that Brazil is not a signatory to the Nuclear Non-Proliferation Treaty. There is a fear that behind the nuclear programs run by the armed forces (the Army, Navy, and Air Force have programs in that area) lies the development of nuclear warfare devices. "The Brazilian nuclear program is for peaceful purposes," insists Sahyun. According to a source in the field, however, if Brazil were to sign the treaty it might have less problems importing.

Since the Navy started its parallel program, which has now been made official, \$440 million has officially been spent on it. Of this, \$70 million was used to import equipment. "Almost all the machine tools we have were imported," admits Pinheiro da Silva. "Fortunately we have them all now, because in recent years the controls over imports have become much tighter, even for ordinary equipment."

The 530 ultracentrifuges now operating at Aramar enrich the uranium to make it suitable for use as nuclear reactor fuel. These machines, which perform the ultracentrifuge process at a speed of 60,000 rotations per minute, were built entirely in Brazil, the Copesp president assured us. He said this project involved intense efforts to get the private industrial sector interested in making parts and equipment for Aramar. Equipment such as the pressurizer, the steam generator, and circulation, cooling, and condensing pumps that Copesp was having trouble importing until recently, had to be made

domestically. "We are trying to diminish our dependence on imports," explains Pinheiro da Silva.

He is a staunch defender of national technological independence, besides being one of the fathers of the Navy program. In 1975, when then-President Emilio Garastazu Medici signed the agreement with Germany for the construction of nuclear plants using KWU technology—of which only Angra I has been completed, with Angra II and III still under construction—Pinheiro da Silva, then a Navy commander, went to the United States to take a postgraduate course in nuclear energy. A year later he suggested to the Navy that it pursue an autonomous nuclear program, to enrich uranium by ultracentrifuge, that would run parallel to the one Brazil had signed with Germany. "The nuclear field is a little like women's fashions; it is expensive and the products quickly become obsolete. The only way to get away from depending on imports is to have our own technology," he said.

#### **'Relending' for Completion of Angra II Considered**

91WP0133D Sao Paulo GAZETA MERCANTIL  
in Portuguese 30 Jul 91 p 10

[Text] The government's economic team will decide by next week whether to authorize a "relending" of \$300 million, requested from Germany's Deutsche Bank and Dresdner Bank through Siemens, to finish the Angra II nuclear power plant being built 30 km from Angra dos Reis. This information was provided by Ronaldo Fabricio, president of the Brazilian Association for the Development of Technical and Industrial Activities in the Nuclear Area (ABIDAN).

On 8 July, Adolf Huettl, worldwide vice president of Siemens, and Gerald Herzog, director of Kraftwerk Union (supplier of the technology and imported equipment for the Angra II and III plants, and a Siemens subsidiary), met in Brasilia with Secretary of Strategic Affairs Pedro Paulo Leone Ramos and with National Secretary of Energy Armando Ribeiro de Araujo to discuss the matter.

They gave the energy secretary a thick stack of documents, including letters from the two banks, which Araujo then turned over to the minister of the economy, who promised to give a final answer within 30 days. However, sources at the ministry say that the request has not yet arrived, but that in any event the answer is going to be "no."

According to Fabricio, it will take \$1.5 billion to complete Angra II. The structural work on that facility is 90 percent complete; most of what remains to be done is the assembly work.

#### **Embraer Wants To Privatize Missile Project**

PY2608160691 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 24 Aug 91 Economic Section p 5

[Text] In compliance with its austerity program, the Embraer [Brazilian Aeronautics Company] is willing to transfer to private enterprise the project to develop the MFA [expansion unknown] antitank missile ordered by the Army Ministry from Orbita (a company absorbed by Embraer) in technological partnership with the Italian Otto Mellara company.

Next week, engineer Antonio Garcia da Silveira, director of Embraer Industrial Relations Department and president of Orbita, will meet with General Romero Lepesqueur, the Army Ministry science and technology secretary, to discuss this matter. "We are going to begin talks," the general said yesterday.

He said that the Army has not yet expressed its position on the transfer of the contract but it is aware of Embraer's intention to limit its involvement to the manufacture of aircraft.

The science and technology secretary said that theoretically, provided that the contract is respected and the new company is qualified, there will be no objection to the transfer.

Three years ago, when the project began, with an investment of \$15 million, the MFA was informally called Leo in honor of former Army Minister Leonidas Pires Goncalves. The program is advanced and everything indicates that the missile will be ready for sale by the end of 1992.

There are no orders as yet because the program only refers to development and tests but it is almost certain that the missile will be sold even on the foreign market because it involves high-level technology, which is of interest to all armies, according to its designers.

The Aeromot Group from Porto Alegre is most likely to be awarded the contract in partnership with Otto Mellara. Claudio Barreto Vianna, chairman of the group, stated yesterday that he was not aware of the matter but expressed interest in the project because it follows with the company's objectives.

The Aeromot Group has already manufactured one of the inertial navigation systems for the AMX—the subsonic fighter aircraft developed jointly with Italy—that allows navigation without the help of land stations.

This enterprise is also developing the system of control and command of the T27 (Tucano) planes, and other projects like the drone [preceding word given in English]—a remote-controlled flying target used for artillery training.

### **Nuclear Industry Undecided on Use of Residue**

PY2508201291 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 23 Aug 91 p 14

[Report by Tania Malheiros]

[Text] Rio de Janeiro—The state-owned Nuclear Industries of Brazil (INB), formerly Nuclebras [Brazilian Nuclear Corporations, Inc.], has yet to decide what it will do with the Brazilian uranium residue stored at Urenco factories in Germany, England, and Holland since 1981. At issue are 780 tonnes of uranium residue left after the process to produce fuel for the Angra 1 Nuclear Power Plant, which was regularly manufactured by Urenco. The uranium residue can be transformed into plutonium (the element used in atomic bombs); it can be used by the arms and armor industry, and by other sectors.

INB Director Jose Carlos Castro told ESTADO News Agency that Brazil could spend nearly \$1 million (380 million cruzeiros) just to transport the 780 tonnes of uranium to Brazil; but it will have to pay \$2.5 million (950 million cruzeiros) in compensation to Urenco if it decided to get rid of the product. "We have not been pressured by Urenco to make a decision yet but that will occur someday," Castro said.

Castro explained that INB has been sending yellow cake [preceding two words in English], the uranium concentrate produced in Pocos de Caldas (Minas Gerais State), to Europe for the past decade. Urenco transforms the yellow cake into uranium hexafluoride (uranium in gas form) and then enriches the product to 3 percent to be used as fuel by Angra 1.

The enriched uranium then returns to the Fuel Elements Factory (FEC) that INB owns in Resende (Rio de Janeiro). Here the fuel is reassembled (Urenco ships the uranium in pellets stored in special rods) and shipped to Angra 1. The uranium residue is what is left over from the operation, Castro explained.

The INB director said that if the product is brought to Brazil it will have to be shipped in 80 containers at a cost of approximately \$900,000. If shipping costs are included, the operation will cost about \$1 million. Castro said the material has a very low radiation level—about 0.3 percent—and could be stored at FEC facilities in Resende.

There are nearly 450,000 tonnes of this material around the world, not counting the Soviet Union. Of this, 250,000 tonnes belong to the United States. According to Castro, Urenco's compensation charges for storing the residue is a company rule for countries that use its enrichment process.

The United States, which also processes uranium, keeps its client's uranium residue if they do not take it away immediately, Castro said.

### **Submarine Reactor To Be Ready 'by 1994'**

PY2608154691 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 24 Aug 91 p 15

[Report by Tania Malheiros]

[Excerpts] Rio de Janeiro—The project to build a Brazilian nuclear submarine has become a definite possibility. Nuclebras [Brazilian Nuclear Corporations] Heavy Equipment Inc. (Nuclep) has confirmed that the experimental reactor needed for initial testing will be ready by 1994. Sulzer, the multinational company involved in the submarine project may be already building the submarine's boilers using Swiss technology.

The reactor and the boilers will be tested at the Navy Armar Experimental Center in Ipero, Sao Paulo State. Nuclep Superintendent Gilson Freitas Coelho did not disclose the amount that the Navy will pay Nuclep for the reactor.

Captain of Sea and War Paulo Roberto da Poz Calheiros, Nuclep's industrial affairs director, has reported that the experimental PWR (Pressurized Water Reactor) will generate only 11 megawatts. According to Calheiros the work will begin as soon as the parts and equipment purchased by Sao Paulo Special Projects Coordinating Board (Copesp) arrive. The captain also said that the reactor will be able to operate on the uranium enriched to 20 percent which is produced at Aramar.

The reactor is based on the same technical principles as the Angra 1 nuclear power plant, although it is much smaller: 4.5 meters high and a 1.8 meters in diameter. [passage omitted]

This week Nuclep reported that two hulls for conventional submarines have been delivered to the Navy and that a third hull is being built. The conventional submarines are being assembled at the Navy Shipyards, in Praca 15, Rio de Janeiro, under the supervision of the Naval Engineering Department (DEN), the Navy Shipyards and the Copesp. In June of this year President Fernando Collor visited the Aramar Experimental Center. During the visit, Admiral Othon Pinheiro da Silva, coordinator of the experimental center reported that the submarine project may go into operation in 1998. "The submarine itself will be ready in the next decade, possibly in 2002, as long as the program does not experience new cuts," Adm. Othon said.

## **CUBA**

### **UN Ambassador Warns of Nuclear Threats**

FL2308001891 Havana Radio Reloj Network in Spanish 1952 GMT 22 Aug 91

[Text] Cuba has alerted the UN Nuclear Disarmament Conference of the persistence of the threat of nuclear explosions due to deficiencies or technical negligence. The Cuban stance was presented to the participants of

the meeting by Ambassador Jose Perez Novoa, who made a detailed analysis of the text and negotiations concerning the chemical arms convention.

The Cuban diplomat said that it is surprising that some of the major and most important countries that have chemical and nuclear weapons call for the immediate elimination of the agreement, but they do not make demands for the prompt elimination of atomic arms and their new technologies with the same passion.

The Cuban diplomat added: My government believes that a prompt resolution of an agreement on a chemical arms convention, even if it is only a partial one within the framework of a more complex general disarmament, would be an achievement.

Perez Novoa stressed in Geneva the initiatives implemented by his country on security issues, among which is

the creation of a list of installations that consume chemical substances in the country that would be subjected to control by the convention.

He also expressed satisfaction on the curtailment of the right to retaliate after remembering the obstacles that had delayed the negotiations for years— in particular, the U.S.' insistence of upholding the protocol on the right to retaliate and 2 percent of the chemical arsenals.

He added: We would be happier if it had been the result of multilateral negotiations in the conference and not of bilateral agreements, which we welcome because undoubtedly they are a new step in the right direction.

With respect to verification, the Cuban ambassador indicated that the best system could not be perfect but a balance needs to be found to make it reliable.

## INDIA

### Satellite Slated for Launch From USSR 29 Aug

BK2708161291 Delhi All India Radio Network  
in English 1530 GMT 27 Aug 91

[Text] The final countdown has begun for the launch of the second indigenously built Indian remote sensing satellite—IRS-1B. It will be launched aboard a Soviet Vostok rocket from the Baykonur Cosmodrome in the Soviet Union shortly after midday on Thursday [29 August]. The Indian Space Research Organization announced in Bangalore this afternoon that the satellite has been mated with the launch vehicle and all final tests have been successfully carried out. The satellite will replace the first remote sensing spacecraft—IRS-1A—which has completed its scheduled three years of operational life.

### China's Decision To Sign Nuclear Treaty Viewed

BK2808102191 Delhi THE HINDUSTAN TIMES  
in English 15 Aug 91 p 11

[Editorial: "China for NPT [Nuclear Non-Proliferation Treaty]" ]

[Text] China's declaration of its intention to sign the Nuclear Non-Proliferation Treaty [NPT] without conditions creates a strategic dilemma in South Asia. It is as certain to upset Pakistan as it is likely to irritate India. Islamabad will be upset because China's decision to sign the NPT, announced by Premier Li Peng during Japanese Prime Minister Toshiki Kaifu's recent visit to Beijing, will amount to a notice that Pakistan's source of acquiring nuclear (and missile) technology will henceforth dry up. This could be rather unnerving for Pakistan as Beijing's decision may mean that its planned supply of a nuclear-powered Han class submarine to Islamabad to neutralise India's strategic advantage from the leased Soviet submarine (since returned by Delhi) will not materialise. China's decision, close on the heels of similar indications from the other nuclear weapons power, France, marks Beijing's grateful acceptance of the courtesy which the world's bigs, led by the United States, have extended to the Asian giant as a member of that exclusive club. China is the only poor country in the UN veto powers' league, poorer than even the Soviet Union. It has no means to catch up with others in the league unless Japan and United States help it in economic and technological development to cover the lost time and ground. That assurance of help awaited China's agreement to go fully with the West in implementing President Bush's blueprint of a new world order. Key elements of that dispensation include a prevention of nuclear non-proliferation and a curb on the spread of missile technology. By agreeing to sign the NPT, China has satisfied the West without notifying any desire to downgrade its status as a major nuclear and missile power.

Mr Li Peng has created some problems for India, although it may be long before China actually signs and ratifies the NPT. Even before it does so, there would be extraordinary pressure on threshold countries like India to sign the treaty. Having acquired nuclear capability, China need not go with India to dub the treaty as discriminatory. After Soviet President Gorbachev's recent agreement with Mr Bush at the Moscow summit to work together to prevent nuclear proliferation, and Mr Li's pledge before Mr Kaifu it would need extraordinary diplomatic skill for a country like India to resist the NPT for long.

### BJP Decries Pakistan's Nuclear Weapons Acquisition

BK1808155691 Delhi All India Radio Network  
in English 1530 GMT 18 Aug 91

[Text] The BJP [Bharatiya Janata Party] has criticized the center for not having a clear-cut policy to deal with the terrorists and secessionists in Kashmir. In a joint statement in New Delhi today, the party vice president, Mr. Sundar Singh Bhandari, Mr. Sikandar Bakht, and Mr. K.R. Malkani expressed concern over the acquisition of nuclear weapons by Pakistan.

### Official Confirms Offer of Nuclear Reactors Sale

BK2608090491 Delhi All India Radio Network  
in English 0830 GMT 26 Aug 91

[Text] India has offered to build nuclear research reactors in foreign countries for training of technocrats in nuclear energy programs. Several countries, including Egypt and Syria, have shown a keen interest in the offer. Disclosing this to newsmen in New Delhi today, the chairman of the Atomic Energy Commission, Dr. P.K. Iyenger, said India has the capabilities for designing, construction, commissioning and operation of five-megawatt research nuclear reactors.

### Improved Sensors in IRS-1B Satellite

91W70136A Bombay THE TIMES OF INDIA  
in English 3 Aug 91 p 3

[Text] Bombay, August 2—The Indian Remote Sensing Satellite (IRS-1B) to be launched by the Vostok launcher from Baikonur cosmodrome in the Soviet Union this month was airlifted to the launch site on July 18.

The IRS-1B will gradually replace IRS-1A which was launched in March 1988.

The life span of satellite, fabricated at the Indian Space Research Organisation's (ISRO) satellite centre in Bangalore, is three years.

The satellite and its test equipment with two ISRO engineers were flown to the Baikonur cosmodrome by an IL-76 transport aircraft chartered by Air India.

The IRS-1B was placed on a special container to ensure that it would not be exposed to excessive vibration.

The director of the ISRO satellite centre, Dr Kasturi Rangan, had told this reporter in Bangalore in May, that IRS-1B was identical functionally to IRS-1A, though some small improvements had been effected in the former.

According to Dr Rangan, there would be more "flexibility" in IRS-1B compared to IRS-1A and there would also be better fuel management.

#### **Details on Remote Sensing Satellite, Launch Plan**

*BK2908164091 Delhi All India Radio Network in English 1530 GMT 29 Aug 91*

[Excerpts] India today joined the select band of nations in remote sensing on continuing basis from space with the successful launch of its satellite, IRS-1B from the Baykonur Cosmodrome in the Soviet Union. According to official sources, the Indian remote sensing satellite, IRS-1B, weighing 985 kg was launched at 1219 Indian standard time by a Vostok rocket. Soon after the launch, the Spacecraft Control Center [SCC] in Bangalore received the telemetry signals from it, indicating proper functioning. Soon after, the participating ground stations around the globe started tracking the satellite.

IRS-1B is intended to ensure continuity of operational remote sensing data services for natural resources survey and management. The data are being used for diverse applications such as agriculture, drought warning, wasteland management, water resources, mineral prospecting, marine and inland fisheries. More than 80 percent of the requirement for satellite remote sensing data of the country is now met by Indian satellites. The satellite launched today will be monitored and control by the ISRO [Indian Space Research Organization] telemetry tracking and command network with the SCC center located at (Pinya), Bangalore.

Both houses of Parliament today hailed the successful launching of the second remote sensing satellite IRS-1B. [passage omitted] The prime minister said that facilities are being set up at Sriharikota to launch the satellites from there by next year. He said 102 crore rupees have been spent so far on the two remote sensing satellites launched by the country.

#### **Parliament Hails Launch of Remote Satellite**

*BK2908131791 Delhi All India Radio Network in English 1230 GMT 29 Aug 91*

[Text] Both houses of parliament today hailed the successful launching of the second remote sensing satellite, RS-1B. Amidst thumping of desks, the prime minister announced that the satellite is now circling 900 km above the surface of the earth. Mr. Rao said the nation's most experienced hands are controlling the satellite at the ISRO [Indian Space Research Organization] telemetry tracking and command network center at (Pinya),

Bangalore. This is connected to other ISRO tracking ground stations at Lucknow and Mauritius. He said all systems and subsystems of the satellite have been designed and fabricated indigenously and the successful launch marks India's commitment to use space technology for peaceful, constructive, and developmental ends. He said remote sensing is an important area for management of the nation's land and ocean resources.

### **IRAQ**

#### **UN Inspector Views Chemical Weapons Destruction**

*NC2208165991 Paris AFP in English 1606 GMT 22 Aug 91*

[By Mahir Chmaytilli]

[Text] Baghdad, Aug 22 (AFP)—Iraqi researchers are trying to develop a technique to destroy their chemical weapons in the sites where they were produced, a U.N. arms inspector said Thursday.

Colonel Jean-Paul Peroz, the head of the United Nations team charged with overseeing their destruction, said Iraqis had similar expertise to that of Western researchers to disarm bombs and missiles tipped with chemicals.

The site that the Iraqis are examining for destroying the chemical warheads is located about 100 kilometers (60 miles) northwest of Baghdad, he said. The Iraqis have named it after the al-Muthanna Company, but Western intelligence services know it as the Samarra' site after the neighboring city.

Al-Muthanna is spread out over 25 square kilometers (9.6 square miles) and is composed of 500 different workshops, including two for the production of organophosphoric material, like Sarin and Tabun, Peroz said.

One of the two workshops could be converted into a place for destroying chemical weapons, he said.

The technique currently studied consists of opening the chemical warheads in an enclosed area, burning the poison in an oven and filtering the resulting gases. Such a process conforms to international ecological norms, he said.

"The Iraqis have taken it upon themselves to make a destruction site with the help of the special (U.N.) committee responsible for disarming Iraq," the French colonel said.

Iraq "has a very good team of engineers, good equipment, and know-how comparable to that of industrialized countries," he said.

Al-Muthanna has stockpiles of 6,420, 22-millimeter rockets—each filled with 3.5 kilograms (7.7 pounds) of chemicals and which could be loaded onto multiple launchers, Peroz said.

There are several other chemical weapons storage sites in Iraq, he said, without saying how many there were exactly. Products made by the Iraqis to arm their shells are not pure, and many projectiles are ineffective. "The Iraqi storage areas are in fact garbage cans," he said.

The U.N. team has inspected three other sites in addition to the al-Muthanna plant: one used for making the component elements of harmful chemical agents, another for pesticides and the third which is incomplete. Allied aircraft bombed and destroyed these three sites during the Gulf war.

On Wednesday the U.N. experts visited the al-Habbaniyah airbase, 70 kilometers (42 miles) west of Baghdad, where they saw a storage facility for 200 mustard-gas bombs to be dropped from aircraft.

Peroz said before he left Baghdad Thursday that the "Iraqis have cooperated very well" with the U.N. mission and "provided all maps of their installations."

## ISRAEL

### 'Successful' Barak Antimissile Missile Test Ends

TA1708154991 Jerusalem Qol Yisra'el in Hebrew  
1500 GMT 17 Aug 91

[Text] The Israeli Aircraft Industries and the Armament Development Authority completed another successful experiment of the Barak antimissile missile. Our Army affairs correspondent Karmela Menashe reports that this was the first experiment with the missile under sea conditions, and all its systems operated as planned. The Barak missile is being developed for the Navy and can be mounted on boats of various sizes. Foreign sources once reported that the missile weighs 98 kg, its warhead weighs 28 kg, it can reach a velocity of Mach 2, and its effective range is between 0.5 and 12 km.

## PAKISTAN

### PRC To Work With Islamabad on Nuclear Issue

BK1908160891 Islamabad Radio Pakistan Network  
in Urdu 1500 GMT 19 Aug 91

[Text] China expressed its willingness to work with Pakistan to help implement Prime Minister Nawaz Sharif's proposal for making South Asia a nuclear-free zone. This was stated by Wasim Sajjad, the chairman of the Senate and leader of the Pakistani delegation, on his return to Islamabad from China after paying a five-day visit to that country.

### Envoy Assured of Canadian Support on Arms Control

BK2408095291 Islamabad Radio Pakistan Overseas  
Service in English 0800 GMT 24 Aug 91

[Text] The Canadian governor general, Mr. Ramon Jean Hnatyshyn, has welcomed Prime Minister Nawaz Sharif's

proposal on nuclear nonproliferation and arms control in the South Asian region. He was speaking at a ceremony at Ottawa while accepting credentials of the newly-appointed Pakistani high commissioner. Retired Air Chief Marshal Hakimullah, in Ottawa. The Canadian governor general said that his country would welcome any initiative that might lead to the signing of a nonproliferation agreement between India and Pakistan because, he said, such an agreement would not only benefit the people of the two countries, but also people in the region.

He also appreciated the government's steps for consolidation of the democratic process and liberalization of the economic system in Pakistan. He hoped that the new approach of the government would play a leading role in broadening economic ties between Pakistan and Canada.

Earlier, Pakistan's high commissioner presented his credentials and spoke about the present government's policies on economic reforms and the nuclear nonproliferation treaty.

### Article Views Prospects for Nuclear Plants

BK2308110791 Islamabad THE MUSLIM in English  
22 Aug 91 p 6

[Article by Farhatullah Babar]

[Text] Three important nuclear holdouts i.e. China, France and South Africa recently announced separately their decisions to join the international non-proliferation regime by agreeing to sign the controversial Non-Proliferation Treaty (NPT).

The treaty aimed at halting the spread of nuclear weapons to non-nuclear states was signed in 1970. It is due for a final review in 1995 when it will be decided by the signatories whether to scrap it or convert it into a permanent feature with or without modifications. Endorsing it at this time by both Beijing and Paris have lent the treaty great respectability as an arms control measure and added to the woes of Islamabad.

The foremost casualty of these developments are the two nuclear power plants promised to Pakistan by China and France. China offered to sell Pakistan a 300-MW power reactor during Prime Minister Li Peng's visit to Islamabad towards the end of 1989. This was followed by a pledge by President Mitterrand to supply a 900-MW power reactor when the French President visited Pakistan during early 90. Will China and France be willing to give Pakistan the promised plants even after they have signed the NPT? Indications are that they have already begun dragging their feet.

For the last over two decades China and France, both nuclear weapons powers, have denounced the NPT as discriminatory against the Third World, China even termed it as 'fraud' perpetrated against developing countries. The two nuclear aspirants of Latin America, i.e.

Brazil and Argentina also recently formalised a regional agreement aimed at controlling the spread of nuclear weapons. All this is bound to increase Islamabad's vulnerability and isolation.

These developments have threatened the prospects of Pakistan acquiring the promised nuclear plants from China and France in more ways than one.

Article I of the NPT forbids a nuclear weapon state from transferring directly or indirectly to any non nuclear weapon state any material or technology "which will encourage or induce (the recipient) to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices".

The definition of a 'nuclear device' however has been left open. Recently while applying Symington Law against Pakistan the US State Department defined a 'device' to include even components and materials remotely connected with nuclear weapons. It is therefore not difficult to imagine that Washington will try to ensure that Paris and Beijing also adopt such stringent definition of a device and thereby deny Islamabad any nuclear assistance invoking Article I of the treaty.

The signs of a change in the thinking are already visible. The 'agreement in principle' to supply Pakistan nuclear power plants has been formalised neither by Paris nor by Beijing despite the fact that 18 months have passed since the agreement was arrived at. France is extremely reluctant to defy international public opinion particularly the one prevailing in the West against the spread of nuclear weapons. It also has a dubious record of having broken in late 70's its promise of supplying a reprocessing plant to Pakistan in return for US aid in the development of nuclear weapons technology system which enabled France to develop its multi-warhead system.

It should therefore come as no surprise if France once again under Washington's influence demands Pakistan to either sign the NPT or accept full scope safeguards on all its nuclear facilities in order to qualify for receiving the promised reactor.

Lack of progress so far on the Franco-Pakistan agreement has heightened this perception. Facing economic squeeze made more acute by the suspension of the US economic aid, Islamabad, cannot build the 2 billion dollar plant without external financial assistance. Paris is therefore employing the easiest expedient of insisting on cash payment for supplying the plant to scuttle the deal. Prime Minister Nawaz Sharif will be content with a stop over at Paris on his way to the UN General Assembly session next month to put up the political facade of continuing negotiations with France.

The same applies to the Pak-China deal but with a little difference. Islamabad is in dire need of a financial package, like the one recently concluded for financing the 850 million dollar Hub [dam] project, to acquire either of the two power reactors. While the French are

simply unwilling to provide financial assistance, the Chinese are just unable to do so because of their own economic constraints. These constraints were highlighted by the failure of the Chinese firm Messrs China Liaoning to undertake last year the construction of Kharian-Pindi road under private financing scheme even though the letter of intent was issued to it in May 90. Apart from threatening the reactor deals, pressure on Islamabad is also bound to increase to sign the NPT. Both China and France had symbolised the hopes and dreams of many Third World countries in their struggle against the unjust Treaty. These countries have now been abandoned and robbed of their argument that the NPT was so discriminatory that two nuclear weapons states had also refused to sign it and that more than half of mankind was opposed to it.

Such arguments will no longer hold valid. The INF treaty and the recent START [expansion unknown] agreement envisaging deep cuts in strategic nuclear arsenals of the two super powers has also knocked the bottom out of the argument that since the nuclear weapon state had not taken steps to honour their Treaty obligations of reducing nuclear stockpiles they were not justified in imposing controls on non-nuclear weapon states.

Where is Pakistan headed to? During the 90 elections the IJI [Islamic Jamhoori Ittehad] brandished real or imaginary nuclear bombs at India and accused Benazir of a nuclear sell out. A victim of his own rhetoric Mr Nawaz Sharif is now faced with this dilemma: If he accepts the NPT he will be swept aside by domestic public opinion largely of his own making, but if he does not he may have to abandon the search for power reactors to meet energy needs and with it his dream of an industrial and technological revolution.

### Editorial Views Challenges to Nuclear Self-Reliance

91AS1154C Lahore NAWA-I-WAQT in Urdu 11 Jun 91 p 11

[Editorial: "The Challenge of Nuclear Self-Reliance"]

[Text] Mr. Ishfaq Ahmed, the new chairman of the Pakistan Atomic Energy Commission, has said that Pakistan has become one of the top twelve nations in the world in the area of atomic science. He said that it was important to be self-sufficient in the area of nuclear technology. The Pakistan Atomic Energy Commission did not only accept this challenge, but also accelerated its efforts to develop its peaceful atomic program. The challenge mentioned by the chairman is not imaginary, but is a real challenge which will help Pakistan rid itself of the energy crisis. It needs atomic power plants for this purpose, for which it has been planning for several years. However, during that period, imports of nuclear technology to Pakistan were made more difficult under the pretext that Pakistan was using the technology to manufacture atomic bombs. Thus the agreement to procure an atomic reprocessing plant from France was canceled, and all western countries stopped all kinds of nuclear technological aid to Pakistan. Many countries in the world have atomic reactors for producing electric power, but the western nations made it impossible for Pakistan to import an atomic reactor

Of course, this situation was a major challenge to the Pakistan Atomic Energy Commission, and to our nuclear scientists and engineers. This is a welcome development that the work to make an atomic reactor in our country is still going on, and Pakistani scientists are trying to obtain expertise in atomic technology. They are running the atomic plant in Karachi on their own, and have succeeded in making nuclear fuel. In any case, the challenge Pakistan is facing in the area of nuclear technology needs trained personnel. Our Atomic Energy Commission in Karachi and Islamabad is giving full attention to meeting this need. The center at Karachi has already given postgraduate training to 200 engineers.

#### **Acquisition of French Nuclear Plant Viewed**

91WP0109A Lahore NAWA-I-WAQT in Urdu  
11 Jun 91 p 11

[Editorial: "Nuclear Plant: Negotiations With France"]

[Text] It was revealed during the questions and answers session in the National Assembly yesterday that negotiations to purchase a 900-megawatt power plant from France will begin between the two countries soon.

Even though relations between Pakistan and France are friendly and both countries agree on most of the international issues, France has backed out twice from helping Pakistan with nuclear technology for its economic, agricultural, medical, and research needs. An agreement was signed for procuring an atomic reprocessing plant and Pakistan had fulfilled all the initial conditions; however, France backed out unilaterally out of this agreement because of U.S. pressure. It has failed to comply with its part of agreement to this date. When the French President Mitterand visited Pakistan during Mrs. Benazir Bhutto's government, he announced that France will provide Pakistan with a 900-megawatts power plant to Pakistan instead of the nuclear reprocessing plant. He also signed an agreement on this matter. However, because of the change in our government, the French Government is once again abandoning its commitment. This is not fair to Pakistan and it does not befits a nation known for its fairness and honesty. However, the French Government is bearing this stigma of breaking its promise because of U.S. pressure. Pakistan has repeatedly announced that its nuclear program is for peaceful purposes; however, the United States refuses to accept these explanations. Now, when negotiations with France are reopened, it is important that France be asked not to breakdown again under pressure.

**DPRK Stance on Nuclear Inspection Viewed***SK2708000991 Moscow Radio Moscow in Korean  
1100 GMT 24 Aug 91*

[Commentary by station commentator Alekseyev]

[Text] According to the opinions of British experts, published in JANE'S INTELLIGENCE REVIEW, North Korea has everything needed for the production of nuclear weapons. However, ROK experts have different opinions. ROK experts stress that the DPRK has no plutonium necessary for the development of nuclear weapons.

In connection with this, station commentator Alekseyev writes as follows.

In reality, I would not like to discuss the possibility of North Korea's development of nuclear weapons because I do not have any correct information about it. Furthermore, this is because Pyongyang keeps all information on nuclear development strictly secret. This gravely concerns the ROK and other countries, including Asian and Pacific countries.

As is known, Pyongyang signed the international Nuclear Non-Proliferation Treaty. This treaty says that if the nations participating in the treaty have any nuclear facilities on their territories, they should accept the international inspection of them surely and unconditionally.

In 1990, Pyongyang held talks with the International Atomic Energy Agency [IAEA] to discuss the issue. This international organization conducts the nuclear inspection. According to the DPRK's proposal, however, the talks were suspended. What is the reason for this?

North Korea said that it would only accept the international inspection of its nuclear facilities with the simultaneous inspection of the U.S. nuclear weapons deployed in the ROK. The IAEA said this was not within its rights. Because of this, Pyongyang refused to continue talks with the IAEA.

Some time ago, the DPRK leadership officially announced that it was willing to resume talks with the IAEA. Pyongyang said once again, however, that the issue of conducting the inspection of nuclear facilities in DPRK territory should be resolved by linking the U.S. nuclear weapons in the ROK. Therefore, there are no changes in the DPRK's position. Instead, some time ago, Seoul expressed its willingness to discuss with Pyongyang all the issues related to the denuclearization of the Korean peninsula, including the issue of the U.S. nuclear weapons in the ROK. In addition, Seoul said that the United States authorized it to discuss the issue with Pyongyang. Therefore, there is no reason for Pyongyang to give up the talks. The ultimate goal of the talks is to synthetically settle the issue of the denuclearization of the Korean peninsula, because Pyongyang has asserted this kind of settlement for a long time.

To my regret, Pyongyang has not yet responded to Seoul's proposal. However, I believe, Pyongyang will constructively respond to it.

**North Korean Nuclear Program Viewed***91WP0137A Moscow KOMSOMOLSKAYA PRAVDA  
in Russian 24 Aug 91 p 5*

[Article by A. Platkovskiy: "Kim Il-song's Favorite 'Mushroom?' New Information About the DPRK Nuclear Program"]

[Text] There are suspicions that North Korea, which defends "the most beautiful socialism" in the Far East, is vigorously working on developing its own nuclear weapons. According to some estimates, North Korea will possess nuclear weapons in two, maybe three years.

So far, no incontrovertible evidence to this effect has been found, with the exception of pictures taken by American spy satellites. However, President of South Korea No Tae-u has no doubts about the fact that Pyongyang has such a program. South Korean intelligence received the latest confirmation from a defector from the DPRK, the highly placed functionary of the security service Choe Sang-kyu. He reported that "work on the decisive weapon"—which is what they call the nuclear program in the North—is in full swing. He referred to information received by him in the course of carrying out a secret mission associated with providing materials for a nuclear installation in the locality of Yongbyon, 90 kilometers to the north of Pyongyang.

American intelligence has long been following what is being built in Yongbyon. Pictures obtained from satellites are available, the analysis of which makes it possible to state that the construction of a quite large graphite gas-cooled nuclear reactor with a capacity of between 100 and 200 megawatts is being completed on this site. No signs have been found of plans to use it for peaceful purposes. In the vicinity, a well-protected structure is easily discernible. By all signs, this is a plant designed to enrich nuclear fuel....

American specialists believe that the technical parameters are sufficient to generate between 15 and 50 kilograms of plutonium a year. This means that by 1994, Pyongyang will have between two and eight bombs similar to the one which destroyed Nagasaki.

Pyongyang continues to categorically deny charges that it intends to become a nuclear power. Moreover, recently the North Korean authorities suddenly agreed to allow International Atomic Energy Agency inspections at their installations. However, this does not at all mean that they are prepared to unreservedly "divulge their secrets." They set a condition: An inspection should be held simultaneously in South Korea where, as Pyongyang maintains, American nuclear weapons numbering 1,700 warheads are located.

Meanwhile, nervousness and suspicion of the two sides, the South and the North, are growing. The Southerners are convinced that the Northerners will lead inspectors by the nose even more successfully than Saddam Husayn has managed to. It is possible that ultimately Pyongyang will show something, but this will be a far cry from what actually exists. The view also exists that the facility in Yongbyon is nothing but "a dummy," and when inspectors arrive there they will see something like a large hog farm.

A Soviet military specialist who worked in Korea for a long time and did not want to reveal his name said: "The North Koreans are not simpletons who would put their secrets in full view." In his opinion, all of the most significant facilities serving the military programs are built inside the mass of the mountains. They are camouflaged in such a manner that no specialist will be able to guess where they are located. This servicemen also believes that, perhaps, Pyongyang did have plans to build its own bomb at one time, but that at present Pyongyang is simply bluffing. "Having encountered great difficulties, the North Koreans resolved to primarily emphasize their missile program. In the south of Korea, there are more than 10 nuclear power stations which make marvelous targets for missile strikes from the North. This is considerably cheaper and more effective than the production of nuclear weapons, which calls for colossal outlays."

By all signs, the South is also seriously concerned about the success of the North in creating its own missile potential. According to information which the South Korean Ministry of Defense has, recently a new secret unit was formed in the DPRK which is armed with Nodon-1 missiles with a range of up to 1,000 kilometers. The Southern military intelligence believes that these missiles carry chemical warheads. North Korea has more than 1,000 units of chemical weapons. Moreover, in the South they are convinced that Pyongyang would have never succeeded in developing its missile muscle without Soviet assistance.

#### **Need for Improved DPRK-Japan Relations**

*SK0509044891 Moscow Radio Moscow in Korean  
0900 GMT 3 Sep 91*

[By station commentator Popov]

[Excerpts] The fourth round of inter-governmental talks between Japan and North Korea to normalize relations ended on 2 September in Beijing.

Station commentator Popov writes as follows: [passage omitted]

I would like to talk briefly about the issue of nuclear safety on the Korean peninsula. This issue occupies a central position in the Tokyo-Pyongyang dialogue.

If the DPRK does not present a reliable guarantee that it will not carry out the work to build nuclear weapons

within North Korea and if it does not start cooperation with the International Atomic Energy Agency [IAEA], we cannot expect to achieve any kind of progress in the Japan-DPRK talks.

The next talks are slated for November. By that time the two Koreas will have joined the United Nations. There is expectation that many issues on the Korean peninsula will be resolved due to the two Koreas' entry into the United Nations.

A draft agreement for signing the nuclear safeguards accord between the DPRK and the IAEA will be carried out and through this there is hope that dialogue between the two Koreas will be resumed.

I believe that the events that are to take place in the next two months will give answers to whether results can be achieved in the fifth round of Japan-North Korea talks.

#### **Soviet Rocket Launches Indian Satellite**

*LD2908082791 Moscow TASS in English 0812 GMT  
29 Aug 91*

[By TASS correspondent Rena Kuznetsova]

[Text] Moscow August 29 TASS—The Indian satellite IRS-1B was launched today at the Baikonur space-launch complex at 0948, Moscow time [0648 gmt]. It was put on near-earth orbit by the Soviet carrier rocket Vostok.

#### **Leningrad Mayor Sobchak Appeal on Weaponry**

*LD2708155391 Moscow Central Television First  
Program Network in Russian 0955 GMT 27 Aug 91*

[Speech by Leningrad Mayor Anatoliy Aleksandrovich Sobchak at extraordinary session of the USSR Supreme Soviet in Moscow—live]

[Excerpt] I would like to make the following appeal to you, and also to the president of the Soviet Union, who is present in this hall. I think we should adopt a special decision concerning the statement made by the Ukrainian leadership regarding the claim that the Armed Forces stationed on the territory of the Ukraine, including Naval Forces and so on, should be subordinated to the Ukrainian leadership.

Esteemed comrades, we need to remember this: We live in a country stuffed with nuclear warheads and there is no small amount of nuclear weaponry on the territory of the Ukraine. Any kind of claim by one republic or another that some of the Armed Forces or some of the weaponry should be handed over to their control are inadmissible. [passage omitted]

**Shaposhnikov Discusses Defense****Split of National Nuclear Forces Ruled Out**

*LD2708171891 Moscow Radio Moscow World Service  
in English 1600 GMT 27 Aug 91*

[Excerpt] Soviet Defense Minister Yevgeniy Shaposhnikov, who is also aviation marshal, has ruled out the possibility of a split of the national nuclear forces. The minister has said these forces will remain at the disposal of the central command. In an interview with the French paper LE FIGARO, he said the ground forces are likely to become the exclusive command of republics, but everybody must understand it is impermissible to inflate the number of nuclear nations. Marshal Shaposhnikov said that a possibility for uncontrolled uses of nuclear forces was ruled out as soon as the coup began, and he doesn't see a danger of this kind in the future. [passage omitted]

**Control During Coup**

*LD2808125191 Moscow TASS International Service  
in Russian 1040 GMT 28 Aug 91*

[By TASS correspondent Oleg Moskovskiy]

[Text] Moscow, 28 Aug (TASS)—“The strategic nuclear forces of the Soviet Union (missile troops, nuclear fleet, strategic aircraft) as well as the tactical nuclear weapons of the ground forces, were and still are under strict and constant control both during the well-known events in the USSR and after them,” stated Army General Vladimir Lobov, chief of the USSR Armed Forces General Staff. He was interviewed by a TASS correspondent in connection with various conjectures in the West about a breach in control of USSR strategic nuclear systems by members of the junta during the failed coup d'etat.

Vladimir Lobov stressed that the prevention of unauthorized use of nuclear weapons is “guaranteed by the appropriate technical and organizational measures within the system of managing the strategic nuclear forces as well as by reliable guarding and defense of nuclear munitions and systems for their delivery.”

## FRANCE

### Mitterrand Concerned Over Soviet Nuclear Weapons

LD2808165591 Paris Antenne-2 Television Network  
in French 1100 GMT 28 Aug 91

[Excerpt] The cabinet meeting this morning discussed the Soviet Union: President Mitterrand read an important report on the subject, and concern was expressed over relations between Europe and what remains of the USSR, and also the problems of the USSR's nuclear capability. Bruno Roger-Petit, you are on the spot:

[Roger-Petit] [Words indistinct] what I can tell you is that Francois Mitterrand in fact expressed concern over what he called a nuclear reordering following the many declarations of independence by former Soviet republics. His precise words have not been reported to us, but here it is being strongly stressed that the issue merits examination and a response. [passage omitted]

## GERMANY

### Stoltenberg: Nuclear Arms, U.S. Troops Necessary

AU2008074591 Duesseldorf HANDELSBLATT  
in German 19 Aug 91 p 3

[Report by "NA": "In Favor of Substantial U.S. Military Presence in Europe"]

[Text] Duesseldorf, 17-18 August—Following the disintegration of the Warsaw Pact and the beginning of conventional disarmament, nuclear weapons are now, more than ever before, political weapons. They will reduce the danger of a possible crisis turning into a military conflict. That was stated by Defense Minister Gerhard Stoltenberg at the international summer course on national security in Kiel.

The summer course has been organized by the Institute of Political Sciences of Christian Albrecht University.

Stoltenberg said that in the future, nuclear weapons will be an instrument preventing the reemergence of threatening scenarios rather than a means of protecting ourselves in dangerous situations. He said that, to live up to this peace-keeping function and goal, the alliance must have the necessary weapons, even though they could be considerably reduced. The minister stressed once again that the Federal Republic of Germany does not plan to control or possess nuclear weapons; however, it is in Germany's special interest not to become a zone of lesser protection by unilaterally renouncing nuclear protection.

Stoltenberg advocated early negotiations on the elimination of nuclear artillery shells and land-based missiles in Europe. He added, however, that in agreement with the

German allies, and based on NATO's London statement, the Federal Government does not want Europe to be denuclearized.

Stoltenberg said that NATO does not need to be given a new meaning; however, its basic strategic concept must be adapted to the security situation, which has undergone far-reaching change. According to Stoltenberg, the NATO forces can be clearly reduced quantitatively. However, NATO continues to need modern main defense forces as well as common, highly mobile rapid deployment forces. The reformulation of NATO's strategy will be completed by the end of the year.

Stoltenberg advocated a substantial U.S. military presence in Europe. He said that, viewed politically and militarily, the United States is also a European power. Europe and the United States have common security and stability interests, said Stoltenberg; therefore, it is important and in line with the statements made at the London NATO summit that the U.S. troops stay in Europe in multinational structures and in certain forms of military integration that have to be newly developed. That includes adequate participation in the rapid deployment forces, said the defense minister.

In Stoltenberg's words, the development of a European security structure requires the readiness and ability of all member states not only to claim equal rights but also to take over equal duties. This makes it so important for Germany to have the greater leeway of action for collective military measures that the Federal Government seeks to achieve. Stoltenberg said: "Without our readiness to make this possible within the framework of Political Union by formulating it in the treaty on the Political Union and within the framework of the United Nations by making clarifying supplementary statements, our credibility regarding the claim that we are defending freedom and the rule of law internationally would be considerably called into question."

### Stoltenberg Hopes for Further Nuclear Arms Cuts

LD2208132391 Hamburg DPA in German 1124 GMT  
22 Aug 91

[Excerpt] Bonn (DPA)—After the success of the democratic forces in the Soviet Union, Defense Minister Gerhard Stoltenberg (CDU) [Christian Democratic Union] hopes for a further reduction of nuclear weapons in the East and West. Stoltenberg said on breakfast television on SAT-1 today that following the victory of democracy in Moscow the Vienna agreement on conventional disarmament and the treaty on the reduction of the intercontinental missiles systems could now finally be ratified. This had been endangered by the events in the Soviet Union in the last few days.

Stoltenberg said he is convinced that the Soviet troops will be withdrawn from eastern Germany as planned by the end of 1994. Staying any longer would make no sense from the Soviet Union's point of view in the long-term after the dissolution of the Warsaw Pact and conclusion

of the treaties. In this sense he has not had any doubts about Soviet treaty compliance over the past few days. [passage omitted]

#### **UN Inspectors Asked To Testify in Export Trial**

*AU1908143791 Hamburg DER SPIEGEL in German 19 Aug 91 p 16*

[Text] In the lawsuit concerning the construction of the poison gas plant in Samarra in Iraq, the Darmstadt public prosecutor's office wants to call UN inspectors as witnesses. These inspectors visited the factory north of Baghdad over the past few weeks; the public prosecutors also want to evaluate secret UN reports. The 13th Division for Criminal Matters of the Darmstadt Regional Court is to make the necessary requests for legal aid to the United Nations.

The UN inspectors took photographs—some of them in secret—of the facilities in Iraq. These photos show the names of German companies. The Samarra photos show company labels of the Hesse Pilot Plant company. Other photos show the name of the Ludwig Hammer company from Franken; investigations against one of Hammer's employees were stopped at the beginning of this year. The name of Preussag AG in Hannover can also be seen. During inspections in Fallujah in Iraq the UN team also discovered a facility for poison gas that cost about 8 million marks and was obviously supplied by the Hamburg company W.E.T. Until recently the authorities did not know to which part of Iraq the factory had been sent between June 1987 and January 1988. However, experts think that the value of the photographs for German investigators is small, since many of the suppliers might not have known the true purpose of the facility.

#### **Genscher Views Nuclear Arms in Soviet Developments**

*LD2308191491 Berlin ADN in German 1457 GMT 23 Aug 91*

[Excerpt] Bonn (ADN)—Greater independence for the USSR's republics must not lead to an increase in those possessing nuclear weapons or those which have them at their disposal. Foreign Minister Hans-Dietrich Genscher warns of this danger, which could become acute if each of the Soviet republics has its own Armed Forces, in a NEUE RUHR ZEITUNG/NEUE RHEIN ZEITUNG (Saturday edition) interview. Genscher demands that the nuclear short-range weapons in East and West disappear as soon as possible as a consequence. Genscher makes an unmistakable appeal to the Western industrialized nations to recognize the historic dimensions of the moment. [passage omitted]

#### **Genscher Urges Western Initiative on Nuclear Arms**

*LD2708082991 Berlin ADN in German 0717 GMT 27 Aug 91*

[Excerpt] Bonn (ADN)—Foreign Minister Hans-Dietrich Genscher has called for a Western initiative on disarmament negotiations in the field of short-range nuclear weapons. In an interview with the Radio Service N.S.R. [Radiodienst N.S.R.] he said that developments in the past few days in the Soviet Union have strongly signaled "that it is high time that short-range nuclear missiles and nuclear artillery shells—both things which are difficult to oversee and check—should go as quickly as possible, throughout the world." For this reason it is necessary "for a Western initiative to be developed which would remove these nuclear weapons in East and West." Strategic nuclear weapons would still remain, but the danger that the number of those having them might increase would lessen.

Genscher went on to say: "The concern that there would be various additional holders of nuclear weapons if the Soviet Union falls apart is a justified concern." However, there is the hope that the republics who wanted to stay together "would achieve fresh internal stability." According to Genscher, the three Baltic republics would certainly not be among them. [passage omitted]

#### **Karlsruhe Center Develops Radiation-Resistant Ceramic**

*91MI0441X Bonn DIE WELT in German 20 Jul 91 p 20*

[Article by Thomas Buhrke: "When Years Become Days in the Laboratory"]

[Text] The road taken by radioactive waste from the nuclear power plant or a major research institute to the place of final disposal is a long one, beset by many technical difficulties. One of these is the fixing of the radioactive substance in resistant materials such as concrete or glass.

But how stable are these materials under the effect of nuclear radiation or intrusion of water into the final storage site? A working group of the Karlsruhe Nuclear Research Center has developed a novel ceramic and has succeeded in testing its high resistance in a "time acceleration experiment." Radioactive wastes consist of a variety of isotopes; some of them decay very quickly, while others remain active for 10,000 years or longer.

Such long-lived isotopes are found in sludges, wastes produced when fuel rods containing plutonium are manufactured or reprocessed. At present, highly radioactive substances are bound primarily in glass. Of course, there are a few problems. For example, because of chemical incompatibilities, glass cannot contain more than around 15 to 25 percent by weight of waste. Moreover, if the concentration of nonsoluble precious metals exceeds a certain amount, they sink to the bottom of the glass

melter and are deposited there. This is an unacceptable characteristic which presents the technicians with a number of problems.

Even when the substances are bound in cement, there are undesirable side effects. A high level of radioactive radiation releases hydrogen within the cement. This then slowly bubbles out and may cause the container drums to bulge.

A new ceramic appears not to pose these problems. It was developed at the Karlsruhe Nuclear Research Center and tested under the direction of Andreas Loida. In preparation for their final disposal, the radioactive wastes are first of all pretreated, then mixed with the ceramic substances kaolin, bentonite, and corundum; water is added and the mixture is shaped into cylindrical pellets.

Finally, the pellets are heated to 1,300° Celsius for around 20 minutes and compacted. This causes a variety of lattice phases to form inside, which envelope the radioactive substances, unlike in glass where the radio-nuclides are evenly distributed and incorporated into the crystal lattice. The new ceramic, called KAB 78, can take up to three times more radioactive waste than glass. This was found to be the case for all known waste mixtures. This means that less space is required for final disposal. Moreover, long-term experiments have shown that the new ceramic appears to be more resistant than glass to brine such as would be expected if there were an intrusion of water in a salt dome.

Loida was able to use an ingenious time acceleration experiment to demonstrate that KAB 78 is also largely unaffected by the nuclear radiation of long-lived isotopes. Instead of binding normal long-lived waste into the ceramic and observing its durability over a period of about 10,000 years, he deliberately enclosed the isotope plutonium 238. This has a much shorter half-life and thus a far greater activity. It enabled the Karlsruhe mineralogist to test the radiation exposure of the ceramic practically, using time acceleration. After eight and one-half months, the sample reached the exposure of normal light water reactor waste and after three years, that of waste from a fast breeder.

Loida and his Czech colleague Rene Pejsa checked the quality of the ceramic at certain intervals. No changes in the structure of the ceramic were found after the maximum exposure period, so this material is clearly extremely resistant to radioactive radiation. In fact, the ceramic was probably "overstressed" during the experiment, since generally speaking, materials are able to withstand long-term low doses better than short high doses.

Whether this development will be put into use in Germany is of course doubtful, since its advantages appear only with highly radioactive substances such as are produced during reprocessing. But the federal government is known not to want this technology used in Germany.

Neighboring countries, however, have already expressed an interest: the French in connection with the solidification of radioactive combustion ash, and the first contracts for the exchange of know-how have already been signed with the British. Last but not least, because of its generally good chemical compatibility with impurities, this new ceramic is also in principle suitable for binding nonradioactive highly toxic substances.

## UNITED KINGDOM

### UK To Help Dispose of Iraqi Nuclear Fuel

91WP0128A London *THE DAILY TELEGRAPH*  
in English 11 Jul 91 p 9

[Article by Peter Hoffer in Vienna and Roger Highfield, Science Editor: "Iraq Nuclear Fuel Task for Britain"]

[Text] Britain has agreed to help dispose of spent Iraqi nuclear fuel, some of which must be recovered from the rubble of Iraqi nuclear facilities demolished during Operation Desert Storm.

The Department of Energy has agreed, jointly with the French Atomic Energy Commission, to recover and render harmless the fuel from two Iraqi research reactors, the International Atomic Energy Agency announced yesterday.

Britain's contribution will be carried out by International Nuclear Decommissioning, a joint venture of the Atomic Energy Authority and British Nuclear Fuels.

To cater for "difficult" fuels, such as from research reactors as well as damaged fuel, AEA Technology, the commercial arm of the energy authority, and BNFL have been co-operating in a scheme to make use of the demonstration fast reactor reprocessing plant at Dounreay.

Several kilograms of highly enriched uranium from the damaged Soviet-built research reactor IRT-5000 and a much smaller amount from the French research reactor Tammuz-2, both located at Tuwaitha in Iraq, will be taken to British and French facilities for storage, reprocessing or other treatment, at the disposal of the agency.

An agency spokesman said the 80 per cent enriched fuel from the five megawatts Russian facility and 93 per cent enriched fuel from the 0.5 megawatt French facility could, for instance, be diluted to below 20 per cent enrichment for reuse as reactor fuel.

While the French reactor was undamaged and the fuel is easily recoverable, one third of the Soviet research reactor fuel is under the rubble of the bombed reactor building, but reported otherwise undamaged.

This fuel is still in the reactor core and has to be recovered by experts from the two countries.

The agency said the division of work has not yet been decided and the details of when and how the operation would be carried out would be determined by the UN Security Council.

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